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(21) International Application Number: PCT/US99/30909 (22) International Filing Date: 23 December 1999 (23.12.99) (30) Priority Data: 09/221,298 23 December 1998 (23.12.98) US 09/347,496 2 July 1999 (02.07.99) US 09/401,064 22 September 1999 (22.09.99) US 09/444,242 19 November 1999 (19.11.99) US 09/454,150 2 December 1999 (02.12.99) US (71) Applicant (for all designated States except US): CORIXA CORPORATION [US/US]; Suite 200, 1124 Columbia Street, Seattle, WA 98104 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): XU, Jiangchun [US/US]; 15805 SE 43rd Place, Bellevue, WA 98006 (US). LODER, Michael, J. [US/US]; 9223 - 36th Avenue SW, Seattle, WA 98126 (US). SECRIST, Heather [US/US]; 3844 - 35th Avenue West, Seattle, WA 98199 (US). BENSON, Darin, R. [US/US]; 723 N. 48th Street, Seattle, WA 98104 (US). MEAGHER, Madeleine, Joy [US/US]; 3819 Interlake Avenue N., Seattle, WA 98103 (US). STOLK, John [US/US]; 7436 NE 144th Place, Bothell, WA 98011		(US). WANG, Tongtong [CN/US]; 8049 NE 28th Street, Medina, WA 98039 (US). YUQIU, Jiang [CN/US]; 5001 South 232nd Street, Kent, WA 98032 (US). (74) Agents: MAKI, David, J. et al.; Seed and Berry LLP, Suite 6300, 701 Fifth Avenue, Seattle, WA 98104-7092 (US). (81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RG, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE (57) Abstract <p>Compositions and methods for the therapy and diagnosis of cancer, such as colon cancer, are disclosed. Compositions may comprise one or more colon tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a colon tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as colon cancer. Diagnostic methods based on detecting a colon tumor protein, or mRNA encoding such a protein, in a sample are also provided.</p>		

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COMPOUNDS FOR IMMUNOTHERAPY AND DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

TECHNICAL FIELD

5 The present invention relates generally to therapy and diagnosis of cancer, such as colon cancer. The invention is more specifically related to polypeptides comprising at least a portion of a colon tumor protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in vaccines and pharmaceutical compositions for prevention and treatment of colon cancer, and for the
10 diagnosis and monitoring of such cancers.

BACKGROUND OF THE INVENTION

Cancer is a significant health problem throughout the world. Although advances have been made in detection and therapy of cancer, no vaccine or other universally successful method for prevention or treatment is currently available. Current therapies, which
15 are generally based on a combination of chemotherapy or surgery and radiation, continue to prove inadequate in many patients.

Colon cancer is the second most frequently diagnosed malignancy in the United States as well as the second most common cause of cancer death. An estimated 95,600 new cases of colon cancer will be diagnosed in 1998, with an estimated 47,700 deaths.
20 The five-year survival rate for patients with colorectal cancer detected in an early localized stage is 92%; unfortunately, only 37% of colorectal cancer is diagnosed at this stage. The survival rate drops to 64% if the cancer is allowed to spread to adjacent organs or lymph nodes, and to 7% in patients with distant metastases.

The prognosis of colon cancer is directly related to the degree of penetration of
25 the tumor through the bowel wall and the presence or absence of nodal involvement, consequently, early detection and treatment are especially important. Currently, diagnosis is aided by the use of screening assays for fecal occult blood, sigmoidoscopy, colonoscopy and double contrast barium enemas. Treatment regimens are determined by the type and stage of the cancer, and include surgery, radiation therapy and/or chemotherapy. Recurrence
30 following surgery (the most common form of therapy) is a major problem and is often the

ultimate cause of death. In spite of considerable research into therapies for the disease, colon cancer remains difficult to diagnose and treat. In spite of considerable research into therapies for these and other cancers, colon cancer remains difficult to diagnose and treat effectively. Accordingly, there is a need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the diagnosis and therapy of cancer, such as colon cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a colon tumor protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises a sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in SEQ ID NO: 1-121, 123-197 and 205-486; (b) variants of a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486; and (c) complements of a sequence of (a) or (b).

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least 15 amino acid residues of a colon tumor protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a colon tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

5 Within related aspects, vaccines are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

10 Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an
15 immunostimulant.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient a pharmaceutical composition or vaccine as recited above.

The present invention further provides, within other aspects, methods for
20 removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of
25 a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a
30 polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under

conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective
5 amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a colon tumor protein; (ii) a polynucleotide encoding such a
10 polypeptide; and (iii) an antigen-presenting cell that expresses such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

Within further aspects, the present invention provides methods for determining
15 the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred
20 embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be colon cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding
25 agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

30 The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a)

contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached figures. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

SEQUENCE IDENTIFIERS

SEQ ID NO: 1 is a first determined cDNA sequence for Contig 1, showing homology to Neutrophil Gelatinase Associated Lipocalin.

SEQ ID NO: 2 is the determined cDNA sequence for Contig 2, showing no significant homology to any known genes.

SEQ ID NO: 3 is the determined cDNA sequence for Contig 4, showing homology to Carcinoembryonic antigen.

5 SEQ ID NO: 4 is the determined cDNA sequence for Contig 5, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 5 is the determined cDNA sequence for Contig 9, showing homology to Carcinoembryonic antigen.

10 SEQ ID NO: 6 is the determined cDNA sequence for Contig 52, showing homology to Carcinoembryonic antigen.

SEQ ID NO: 7 is the determined cDNA sequence for Contig 6, showing homology to Villin.

SEQ ID NO: 8 is the determined cDNA sequence for Contig 8, showing no significant homology to any known genes.

15 SEQ ID NO: 9 is the determined cDNA sequence for Contig 10, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 10 is the determined cDNA sequence for Contig 19, showing homology to Transforming Growth Factor (BIGH3).

20 SEQ ID NO: 11 is the determined cDNA sequence for Contig 21, showing homology to Transforming Growth Factor (BIGH3).

SEQ ID NO: 12 is the determined cDNA sequence for Contig 11, showing homology to CO-029.

SEQ ID NO: 13 is the determined cDNA sequence for Contig 55, showing homology to CO-029.

25 SEQ ID NO: 14 is the determined cDNA sequence for Contig 12, showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P.

SEQ ID NO: 15 is the determined cDNA sequence for Contig 13, showing no significant homology to any known gene.

30 SEQ ID NO: 16 is the determined cDNA sequence for Contig 14, also referred to as 14261, showing no significant homology to any known gene.

SEQ ID NO: 17 is the determined cDNA sequence for Contig 15, showing homology to Ets-Related Transcription Factor (ERT).

SEQ ID NO: 18 is the determined cDNA sequence for Contig 16, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

5 SEQ ID NO: 19 is the determined cDNA sequence for Contig 24, showing homology to Chromosome 5, PAC clone 228g9 (LBNL H142).

SEQ ID NO: 20 is the determined cDNA sequence for Contig 17, showing homology to Cytokeratin.

10 SEQ ID NO: 21 is the determined cDNA sequence for Contig 18, showing homology to L1-Cadherin.

SEQ ID NO: 22 is the determined cDNA sequence for Contig 20, showing no significant homology to any known gene.

SEQ ID NO: 23 is the determined cDNA sequence for Contig 22, showing homology to Bumetanide-sensitive Na-K-Cl cotransporter (NKCC1).

15 SEQ ID NO: 24 is the determined cDNA sequence for Contig 23, showing no significant homology to any known gene.

SEQ ID NO: 25 is the determined cDNA sequence for Contig 25, showing homology to Macrophage Inflammatory Protein 3 alpha.

20 SEQ ID NO: 26 is the determined cDNA sequence for Contig 26, showing homology to Laminin.

SEQ ID NO: 27 is the determined cDNA sequence for Contig 48, showing homology to Laminin.

SEQ ID NO: 28 is the determined cDNA sequence for Contig 27, showing homology to Myotubularin (MTM1).

25 SEQ ID NO: 29 is the determined cDNA sequence for Contig 28, showing homology to Chromosome 16 BAC clone CIT987SK-A-363E6.

SEQ ID NO: 30 is the determined cDNA sequence for Contig 29, also referred to as C751P and 14247, showing no significant homology to any known gene, but partial homology to Rat GSK-3 β -interacting protein Axil homolog.

30 SEQ ID NO: 31 is the determined cDNA sequence for Contig 30, showing homology to Zinc Finger Transcription Factor (ZNF207).

SEQ ID NO: 32 is the determined cDNA sequence for Contig 31, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

5 SEQ ID NO: 33 is the determined cDNA sequence for Contig 35, showing no significant homology to any known gene, but partial homology to Mus musculus GOB-4 homolog.

SEQ ID NO: 34 is the determined cDNA sequence for Contig 32, showing no significant homology to any known gene.

10 SEQ ID NO: 35 is the determined cDNA sequence for Contig 34, showing homology to Desmoglein 2.

SEQ ID NO: 36 is the determined cDNA sequence for Contig 36, showing no significant homology to any known gene.

SEQ ID NO: 37 is the determined cDNA sequence for Contig 37, showing homology to Putative Transmembrane Protein.

15 SEQ ID NO: 38 is the determined cDNA sequence for Contig 38, also referred to as C796P and 14219, showing no significant homology to any known gene.

SEQ ID NO: 39 is the determined cDNA sequence for Contig 40, showing homology to Nonspecific Cross-reacting Antigen.

20 SEQ ID NO: 40 is the determined cDNA sequence for Contig 41, also referred to as C799P and 14308, showing no significant homology to any known gene.

SEQ ID NO: 41 is the determined cDNA sequence for Contig 42, also referred to as C794P and 14309, showing no significant homology to any known gene.

SEQ ID NO: 42 is the determined cDNA sequence for Contig 43, showing homology to Chromosome 1 specific transcript KIAA0487.

25 SEQ ID NO: 43 is the determined cDNA sequence for Contig 45, showing homology to hMCM2.

SEQ ID NO: 44 is the determined cDNA sequence for Contig 46, showing homology to ETS2.

30 SEQ ID NO: 45 is the determined cDNA sequence for Contig 49, showing homology to Pump-1.

SEQ ID NO: 46 is the determined cDNA sequence for Contig 50, also referred to as C792P and 18323, showing no significant homology to any known gene.

SEQ ID NO: 47 is the determined cDNA sequence for Contig 51, also referred to as C795P and 14317, showing no significant homology to any known gene.

5 SEQ ID NO: 48 is the determined cDNA sequence for 11092, showing no significant homology to any known gene.

SEQ ID NO: 49 is the determined cDNA sequence for 11093, showing no significant homology to any known gene.

10 SEQ ID NO: 50 is the determined cDNA sequence for 11094, showing homology to Human Putative Enterocyte Differentiation Protein.

SEQ ID NO: 51 is the determined cDNA sequence for 11095, showing homology to Human Transcriptional Corepressor hKAP1/TIF1B mRNA.

SEQ ID NO: 52 is the determined cDNA sequence for 11096, showing no significant homology to any known gene.

15 SEQ ID NO: 53 is the determined cDNA sequence for 11097, showing homology to Human Nonspecific Antigen.

SEQ ID NO: 54 is the determined cDNA sequence for 11098, showing no significant homology to any known gene.

20 SEQ ID NO: 55 is the determined cDNA sequence for 11099, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 56 is the determined cDNA sequence for 11186, showing homology to Human Pancreatic Secretory Inhibitor (PST) mRNA.

SEQ ID NO: 57 is the determined cDNA sequence for 11101, showing homology to Human Chromosome X.

25 SEQ ID NO: 58 is the determined cDNA sequence for 11102, showing homology to Human Chromosome X.

SEQ ID NO: 59 is the determined cDNA sequence for 11103, showing no significant homology to any known gene.

30 SEQ ID NO: 60 is the determined cDNA sequence for 11174, showing no significant homology to any known gene.

SEQ ID NO: 61 is the determined cDNA sequence for 11104, showing homology to Human mRNA for KIAA0154.

SEQ ID NO: 62 is the determined cDNA sequence for 11105, showing homology to Human Apurinic/Apyrimidinic Endonuclease (hap1)mRNA.

5 SEQ ID NO: 63 is the determined cDNA sequence for 11106, showing homology to Human Chromosome 12p13.

SEQ ID NO: 64 is the determined cDNA sequence for 11107, showing homology to Human 90 kDa Heat Shock Protein.

10 SEQ ID NO: 65 is the determined cDNA sequence for 11108, showing no significant homology to any known gene.

SEQ ID NO: 66 is the determined cDNA sequence for 11112, showing no significant homology to any known gene.

SEQ ID NO: 67 is the determined cDNA sequence for 11115, showing no significant homology to any known gene.

15 SEQ ID NO: 68 is the determined cDNA sequence for 11117, showing no significant homology to any known gene.

SEQ ID NO: 69 is the determined cDNA sequence for 11118, showing no significant homology to any known gene.

20 SEQ ID NO: 70 is the determined cDNA sequence for 11119, showing homology to Human Elongation Factor 1-alpha.

SEQ ID NO: 71 is the determined cDNA sequence for 11121, showing homology to Human Lamin B Receptor (LBR) mRNA.

SEQ ID NO: 72 is the determined cDNA sequence for 11122, showing homology to H. sapiens mRNA for Novel Glucocorticoid.

25 SEQ ID NO: 73 is the determined cDNA sequence for 11123, showing homology to H. sapiens mRNA for snRNP protein B.

SEQ ID NO: 74 is the determined cDNA sequence for 11124, showing homology to Human Cisplatin Resistance Associated Beta-protein.

30 SEQ ID NO: 75 is the determined cDNA sequence for 11127, showing homology to M. musculus Calumenin mRNA.

SEQ ID NO: 76 is the determined cDNA sequence for 11128, showing homology to Human ras-related small GTP binding protein.

SEQ ID NO: 77 is the determined cDNA sequence for 11130, showing homology to Human Cosmid U169d2.

5 SEQ ID NO: 78 is the determined cDNA sequence for 11131, showing homology to H. sapiens mRNA for protein homologous to Elongation 1-g.

SEQ ID NO: 79 is the determined cDNA sequence for 11134, showing no significant homology to any known gene.

10 SEQ ID NO: 80 is the determined cDNA sequence for 11135, showing homology to H. sapiens Nieman-Pick (NPC1) mRNA.

SEQ ID NO: 81 is the determined cDNA sequence for 11137, showing homology to H. sapiens mRNA for Niecin b-chain.

SEQ ID NO: 82 is the determined cDNA sequence for 11138, showing homology to Human Endogenous Retroviral Protease mRNA.

15 SEQ ID NO: 83 is the determined cDNA sequence for 11139, showing homology to H. sapiens mRNA for DMBT1 protein.

SEQ ID NO: 84 is the determined cDNA sequence for 11140, showing homology to H. sapiens ras GTPase activating-like protein.

20 SEQ ID NO: 85 is the determined cDNA sequence for 11143, showing homology to Human Acidic Ribosomal Phosphoprotein PO mRNA.

SEQ ID NO: 86 is the determined cDNA sequence for 11144, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 87 is the determined cDNA sequence for 11145, showing homology to Human GTP-binding protein.

25 SEQ ID NO: 88 is the determined cDNA sequence for 11148, showing homology to H. sapiens U21 mRNA.

SEQ ID NO: 89 is the determined cDNA sequence for 11151, showing no significant homology to any known gene.

30 SEQ ID NO: 90 is the determined cDNA sequence for 11154, showing no significant homology to any known gene.

SEQ ID NO: 91 is the determined cDNA sequence for 11156, showing homology to H. sapiens Ribosomal Protein L27.

SEQ ID NO: 92 is the determined cDNA sequence for 11157, showing homology to H. sapiens Ribosomal Protein L27.

5 SEQ ID NO: 93 is the determined cDNA sequence for 11158, showing no significant homology to any known gene.

SEQ ID NO: 94 is the determined cDNA sequence for 11162, showing homology to Ag-X antigen.

10 SEQ ID NO: 95 is the determined cDNA sequence for 11164, showing homology to H. sapiens mRNA for Signal Recognition Protein sub14.

SEQ ID NO: 96 is the determined cDNA sequence for 11165, showing homology to Human PAC 204e5/127h14.

SEQ ID NO: 97 is the determined cDNA sequence for 11166, showing homology to Human mRNA for KIAA0108.

15 SEQ ID NO: 98 is the determined cDNA sequence for 11167, showing homology to H. sapiens mRNA for Neutrophil Gelatinase asst. Lipocalin.

SEQ ID NO: 99 is the determined cDNA sequence for 11168, showing no significant homology to any known gene.

20 SEQ ID NO: 100 is the determined cDNA sequence for 11172, showing no significant homology to any known gene.

SEQ ID NO: 101 is the determined cDNA sequence for 11175, showing no significant homology to any known gene.

SEQ ID NO: 102 is the determined cDNA sequence for 11176, showing homology to Human maspin mRNA.

25 SEQ ID NO: 103 is the determined cDNA sequence for 11177, showing homology to Human Carcinoembryonic Antigen.

SEQ ID NO: 104 is the determined cDNA sequence for 11178, showing homology to Human A-Tubulin mRNA.

30 SEQ ID NO: 105 is the determined cDNA sequence for 11179, showing homology to Human mRNA for proton-ATPase-like protein.

SEQ ID NO: 106 is the determined cDNA sequence for 11180, showing homology to Human HepG2 3' region cDNA clone hmd.

SEQ ID NO: 107 is the determined cDNA sequence for 11182, showing homology to Human MHC homologous to Chicken B-Complex Protein.

5 SEQ ID NO: 108 is the determined cDNA sequence for 11183, showing homology to Human High Mobility Group Box (SSRP1) mRNA.

SEQ ID NO: 109 is the determined cDNA sequence for 11184, showing no significant homology to any known gene.

10 SEQ ID NO: 110 is the determined cDNA sequence for 11185, showing no significant homology to any known gene.

SEQ ID NO: 111 is the determined cDNA sequence for 11187, showing no significant homology to any known gene.

SEQ ID NO: 112 is the determined cDNA sequence for 11190, showing homology to Human Replication Protein A 70kDa.

15 SEQ ID NO: 113 is the determined cDNA sequence for Contig 47, also referred to as C797P, showing homology to Human Chromosome X clone bWXD342.

SEQ ID NO: 114 is the determined cDNA sequence for Contig 7, showing homology to Equilibrative Nucleoside Transporter 2 (ent2).

20 SEQ ID NO: 115 is the determined cDNA sequence for 14235.1, also referred to as C791P, showing homology to H. sapiens chromosome 21 derived BAC containing ets-2 gene.

SEQ ID NO: 116 is the determined cDNA sequence for 14287.2, showing no significant homology to any known gene, but some degree of homology to Putative Transmembrane Protein.

25 SEQ ID NO: 117 is the determined cDNA sequence for 14233.1, also referred to as Contig 48, showing no significant homology to any known gene.

SEQ ID NO: 118 is the determined cDNA sequence for 14298.2, also referred to as C793P, showing no significant homology to any known gene.

30 SEQ ID NO: 119 is the determined cDNA sequence for 14372, also referred to as Contig 44, showing no significant homology to any known gene.

SEQ ID NO: 120 is the determined cDNA sequence for 14295, showing homology to secreted cement gland protein XAG-2 homolog.

SEQ ID NO: 121 is the determined full-length cDNA sequence for a clone showing homology to Beta IG-H3.

5 SEQ ID NO: 122 is the predicted amino acid sequence for the clone of SEQ ID NO: 121.

SEQ ID NO: 123 is a longer determined cDNA sequence for C751P.

SEQ ID NO: 124 is a longer determined cDNA sequence for C791P.

SEQ ID NO: 125 is a longer determined cDNA sequence for C792P.

10 SEQ ID NO: 126 is a longer determined cDNA sequence for C793P.

SEQ ID NO: 127 is a longer determined cDNA sequence for C794P.

SEQ ID NO: 128 is a longer determined cDNA sequence for C795P.

SEQ ID NO: 129 is a longer determined cDNA sequence for C796P.

SEQ ID NO: 130 is a longer determined cDNA sequence for C797P.

15 SEQ ID NO: 131 is a longer determined cDNA sequence for C798P.

SEQ ID NO: 132 is a longer determined cDNA sequence for C799P.

SEQ ID NO: 133 is a first partial determined cDNA sequence for CoSub-3 (also known as 23569).

20 SEQ ID NO: 134 is a second partial determined cDNA sequence for CoSub-3 (also known as 23569).

SEQ ID NO: 135 is a first partial determined cDNA sequence for CoSub-13 (also known as 23579).

SEQ ID NO: 136 is a second partial determined cDNA sequence for CoSub-13 (also known as 23579).

25 SEQ ID NO: 137 is the determined cDNA sequence for CoSub-17 (also known as 23583).

SEQ ID NO: 138 is the determined cDNA sequence for CoSub-19 (also known as 23585).

30 SEQ ID NO: 139 is the determined cDNA sequence for CoSub-22 (also known as 23714).

SEQ ID NO: 140 is the determined cDNA sequence for CoSub-23 (also known as 23715).

SEQ ID NO: 141 is the determined cDNA sequence for CoSub-26 (also known as 23717).

5 SEQ ID NO: 142 is the determined cDNA sequence for CoSub-33 (also known as 23724).

SEQ ID NO: 143 is the determined cDNA sequence for CoSub-34 (also known as 23725).

10 SEQ ID NO: 144 is the determined cDNA sequence for CoSub-35 (also known as 23726).

SEQ ID NO: 145 is the determined cDNA sequence for CoSub-37 (also known as 23728).

SEQ ID NO: 146 is the determined cDNA sequence for CoSub-39 (also known as 23730).

15 SEQ ID NO: 147 is the determined cDNA sequence for CoSub-42 (also known as 23766).

SEQ ID NO: 148 is the determined cDNA sequence for CoSub-44 (also known as 23768).

20 SEQ ID NO: 149 is the determined cDNA sequence for CoSub-47 (also known as 23771).

SEQ ID NO: 150 is the determined cDNA sequence for CoSub-54 (also known as 23778).

SEQ ID NO: 151 is the determined cDNA sequence for CoSub-55 (also known as 23779).

25 SEQ ID NO: 152 is the determined cDNA sequence for CT1 (also known as 24099).

SEQ ID NO: 153 is the determined cDNA sequence for CT2 (also known as 24100).

SEQ ID NO: 154 is the determined cDNA sequence for CT3 (also known as 24101).

SEQ ID NO: 155 is the determined cDNA sequence for CT6 (also known as 24104).

SEQ ID NO: 156 is the determined cDNA sequence for CT7 (also known as 24105).

30 SEQ ID NO: 157 is the determined cDNA sequence for CT12 (also known as 24110).

SEQ ID NO: 158 is the determined cDNA sequence for CT13 (also known as 24111).

SEQ ID NO: 159 is the determined cDNA sequence for CT14 (also known as 24112).
SEQ ID NO: 160 is the determined cDNA sequence for CT15 (also known as 24113).
SEQ ID NO: 161 is the determined cDNA sequence for CT17 (also known as 24115).
SEQ ID NO: 162 is the determined cDNA sequence for CT18 (also known as 24116).
5 SEQ ID NO: 163 is the determined cDNA sequence for CT22 (also known as 23848).
SEQ ID NO: 164 is the determined cDNA sequence for CT24 (also known as 23849).
SEQ ID NO: 165 is the determined cDNA sequence for CT31 (also known as 23854).
SEQ ID NO: 166 is the determined cDNA sequence for CT34 (also known as 23856).
SEQ ID NO: 167 is the determined cDNA sequence for CT37 (also known as 23859).
10 SEQ ID NO: 168 is the determined cDNA sequence for CT39 (also known as 23860).
SEQ ID NO: 169 is the determined cDNA sequence for CT40 (also known as 23861).
SEQ ID NO: 170 is the determined cDNA sequence for CT51 (also known as 24130).
SEQ ID NO: 171 is the determined cDNA sequence for CT53 (also known as 24132).
SEQ ID NO: 172 is the determined cDNA sequence for CT63 (also known as 24595).
15 SEQ ID NO: 173 is the determined cDNA sequence for CT88 (also known as 24608).
SEQ ID NO: 174 is the determined cDNA sequence for CT92 (also known as 24800).
SEQ ID NO: 175 is the determined cDNA sequence for CT94 (also known as 24802).
SEQ ID NO: 176 is the determined cDNA sequence for CT102 (also known as
24805).
20 SEQ ID NO: 177 is the determined cDNA sequence for CT103 (also known as
24806).
SEQ ID NO: 178 is the determined cDNA sequence for CT111 (also known as
25520).
SEQ ID NO: 179 is the determined cDNA sequence for CT118 (also known as
25 25522).
SEQ ID NO: 180 is the determined cDNA sequence for CT121 (also known as
25523).
SEQ ID NO: 181 is the determined cDNA sequence for CT126 (also known as
25527).
30 SEQ ID NO: 182 is the determined cDNA sequence for CT135 (also known as
25534).

SEQ ID NO: 183 is the determined cDNA sequence for CT140 (also known as 25537).

SEQ ID NO: 184 is the determined cDNA sequence for CT145 (also known as 25542).

5 SEQ ID NO: 185 is the determined cDNA sequence for CT147 (also known as 25543).

SEQ ID NO: 186 is the determined cDNA sequence for CT148 (also known as 25544).

10 SEQ ID NO: 187 is the determined cDNA sequence for CT502 (also known as 26420).

SEQ ID NO: 188 is the determined cDNA sequence for CT507 (also known as 26425).

SEQ ID NO: 189 is the determined cDNA sequence for CT521 (also known as 27366).

15 SEQ ID NO: 190 is the determined cDNA sequence for CT544 (also known as 27375).

SEQ ID NO: 191 is the determined cDNA sequence for CT577 (also known as 27385).

20 SEQ ID NO: 192 is the determined cDNA sequence for CT580 (also known as 27387).

SEQ ID NO: 193 is the determined cDNA sequence for CT594 (also known as 27540).

SEQ ID NO: 194 is the determined cDNA sequence for CT606 (also known as 27547).

25 SEQ ID NO: 195 is the determined cDNA sequence for CT607 (also known as 27548).

SEQ ID NO: 196 is the determined cDNA sequence for CT599 (also known as 27903).

30 SEQ ID NO: 197 is the determined cDNA sequence for CT632 (also known as 27922).

SEQ ID NO: 198 is the predicted amino acid sequence for CT502 (SEQ ID NO: 187).

SEQ ID NO: 199 is the predicted amino acid sequence for CT507 (SEQ ID NO: 188).
SEQ ID NO: 200 is the predicted amino acid sequence for CT521 (SEQ ID NO: 189).
SEQ ID NO: 201 is the predicted amino acid sequence for CT544 (SEQ ID NO: 190).
SEQ ID NO: 202 is the predicted amino acid sequence for CT606 (SEQ ID NO: 194).
5 SEQ ID NO: 203 is the predicted amino acid sequence for CT607 (SEQ ID NO: 195).
SEQ ID NO: 204 is the predicted amino acid sequence for CT632 (SEQ ID NO: 197).
SEQ ID NO: 205 is the determined cDNA sequence for clone 25244.
SEQ ID NO: 206 is the determined cDNA sequence for clone 25245.
SEQ ID NO: 207 is the determined cDNA sequence for clone 25246.
10 SEQ ID NO: 208 is the determined cDNA sequence for clone 25248.
SEQ ID NO: 209 is the determined cDNA sequence for clone 25249.
SEQ ID NO: 210 is the determined cDNA sequence for clone 25250.
SEQ ID NO: 211 is the determined cDNA sequence for clone 25251.
SEQ ID NO: 212 is the determined cDNA sequence for clone 25252.
15 SEQ ID NO: 213 is the determined cDNA sequence for clone 25253.
SEQ ID NO: 214 is the determined cDNA sequence for clone 25254.
SEQ ID NO: 215 is the determined cDNA sequence for clone 25255.
SEQ ID NO: 216 is the determined cDNA sequence for clone 25256.
SEQ ID NO: 217 is the determined cDNA sequence for clone 25257.
20 SEQ ID NO: 218 is the determined cDNA sequence for clone 25259.
SEQ ID NO: 219 is the determined cDNA sequence for clone 25260.
SEQ ID NO: 220 is the determined cDNA sequence for clone 25261.
SEQ ID NO: 221 is the determined cDNA sequence for clone 25262.
SEQ ID NO: 222 is the determined cDNA sequence for clone 25263.
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SEQ ID NO: 224 is the determined cDNA sequence for clone 25265.
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SEQ ID NO: 229 is the determined cDNA sequence for clone 25271.

SEQ ID NO: 230 is the determined cDNA sequence for clone 25272.
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5 SEQ ID NO: 234 is the determined cDNA sequence for clone 25276.
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SEQ ID NO: 236 is the determined cDNA sequence for clone 25278.
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10 SEQ ID NO: 239 is the determined cDNA sequence for clone 25282.
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20 SEQ ID NO: 249 is the determined cDNA sequence for clone 25292.
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SEQ ID NO: 253 is the determined cDNA sequence for clone 25296.
25 SEQ ID NO: 254 is the determined cDNA sequence for clone 25297.
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30 SEQ ID NO: 259 is the determined cDNA sequence for clone 25422.
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SEQ ID NO: 261 is the determined cDNA sequence for clone 25424.
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10 SEQ ID NO: 270 is the determined cDNA sequence for clone 25434.
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SEQ ID NO: 273 is the determined cDNA sequence for clone 25437.
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SEQ ID NO: 300 is the determined cDNA sequence for clone 25860.
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SEQ ID NO: 302 is the determined cDNA sequence for clone 25862.
SEQ ID NO: 303 is the determined cDNA sequence for clone 25863.
SEQ ID NO: 304 is the determined cDNA sequence for clone 25864.
SEQ ID NO: 305 is the determined cDNA sequence for clone 25865.
15 SEQ ID NO: 306 is the determined cDNA sequence for clone 25866.
SEQ ID NO: 307 is the determined cDNA sequence for clone 25867.
SEQ ID NO: 308 is the determined cDNA sequence for clone 25868.
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20 SEQ ID NO: 311 is the determined cDNA sequence for clone 25871.
SEQ ID NO: 312 is the determined cDNA sequence for clone 25872.
SEQ ID NO: 313 is the determined cDNA sequence for clone 25873.
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SEQ ID NO: 315 is the determined cDNA sequence for clone 25876.
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30 SEQ ID NO: 321 is the determined cDNA sequence for clone 25882.
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5 SEQ ID NO: 327 is the determined cDNA sequence for clone 25888.
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SEQ ID NO: 329 is the determined cDNA sequence for clone 25890.
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10 SEQ ID NO: 332 is the determined cDNA sequence for clone 25895.
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SEQ ID NO: 334 is the determined cDNA sequence for clone 25897.
SEQ ID NO: 335 is the determined cDNA sequence for clone 25899.
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15 SEQ ID NO: 337 is the determined cDNA sequence for clone 25901.
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20 SEQ ID NO: 342 is the determined cDNA sequence for clone 25907.
SEQ ID NO: 343 is the determined cDNA sequence for clone 25908.
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10 SEQ ID NO: 363 is the determined cDNA sequence for clone 25929.
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30 SEQ ID NO: 383 is the determined cDNA sequence for clone 31980.
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10 SEQ ID NO: 394 is the determined cDNA sequence for clone 31986.
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15 SEQ ID NO: 399 is the determined cDNA sequence for clone 32012.
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SEQ ID NO: 405 is the determined cDNA sequence for clone 32022.
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SEQ ID NO: 408 is the determined cDNA sequence for clone 31989.
25 SEQ ID NO: 409 is the determined cDNA sequence for clone 32015.
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30 SEQ ID NO: 414 is the determined cDNA sequence for clone 32007.
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SEQ ID NO: 416 is the determined cDNA sequence for clone 31935.
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5 SEQ ID NO: 420 is the determined cDNA sequence for clone 31971.
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10 SEQ ID NO: 425 is the determined cDNA sequence for clone 32006.
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20 SEQ ID NO: 435 is the determined cDNA sequence for clone 32010.
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SEQ ID NO: 444 is the determined cDNA sequence for clone 31984.
30 SEQ ID NO: 445 is the determined cDNA sequence for clone 32024.
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SEQ ID NO: 447 is the determined cDNA sequence for clone 31943.
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SEQ ID NO: 450 is the determined cDNA sequence for clone 32009.
5 SEQ ID NO: 451 is the determined cDNA sequence for clone 32019.
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SEQ ID NO: 455 is the determined cDNA sequence for clone 31955.
10 SEQ ID NO: 456 is the determined cDNA sequence for clone 31951.
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SEQ ID NO: 458 is the determined cDNA sequence for clone 31962.
SEQ ID NO: 459 is the determined cDNA sequence for clone 32001.
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15 SEQ ID NO: 461 is the determined cDNA sequence for clone 31944.
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SEQ ID NO: 463 is the determined cDNA sequence for clone 31828.
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SEQ ID NO: 465 is the determined cDNA sequence for clone 31841.
20 SEQ ID NO: 466 is the determined cDNA sequence for clone 31847.
SEQ ID NO: 467 is the determined cDNA sequence for clone 31850.
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SEQ ID NO: 470 is the determined cDNA sequence for clone 31858.
25 SEQ ID NO: 471 is the determined cDNA sequence for clone 31861.
SEQ ID NO: 472 is the determined cDNA sequence for clone 31868.
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30 SEQ ID NO: 476 is the determined cDNA sequence for clone 31877.
SEQ ID NO: 477 is the determined cDNA sequence for clone 31878.

SEQ ID NO: 478 is the determined cDNA sequence for clone 31885.

SEQ ID NO: 479 is the determined cDNA sequence for clone 31888.

SEQ ID NO: 480 is the determined cDNA sequence for clone 31890.

SEQ ID NO: 481 is the determined cDNA sequence for clone 31893.

5 SEQ ID NO: 482 is the determined cDNA sequence for clone 31898.

SEQ ID NO: 483 is the determined cDNA sequence for clone 31901.

SEQ ID NO: 484 is the determined cDNA sequence for clone 31909.

SEQ ID NO: 485 is the determined cDNA sequence for clone 31910.

SEQ ID NO: 486 is the determined cDNA sequence for clone 31914.

10

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for the therapy and diagnosis of cancer, such as colon cancer. The compositions described herein may include colon tumor polypeptides, polynucleotides encoding such

15 polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). Polypeptides of the present invention generally comprise at least a portion (such as an immunogenic portion) of a colon tumor protein or a variant thereof. A "colon tumor protein" is a protein that is expressed in colon tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in

20 a normal tissue, as determined using a representative assay provided herein. Certain colon tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with colon cancer. Polynucleotides of the subject invention generally comprise a DNA or RNA sequence that encodes all or a portion of such a polypeptide, or that is complementary to such a sequence.

25 Antibodies are generally immune system proteins, or antigen-binding fragments thereof, that are capable of binding to a polypeptide as described above. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B-cells that express a polypeptide as described above. T cells that may be employed within such compositions are generally T cells that are specific for a polypeptide as described above.

The present invention is based on the discovery of human colon tumor proteins. Sequences of polynucleotides encoding specific tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486.

5 COLON TUMOR PROTEIN POLYNUCLEOTIDES

Any polynucleotide that encodes a colon tumor protein or a portion or other variant thereof as described herein is encompassed by the present invention. Preferred polynucleotides comprise at least 15 consecutive nucleotides, preferably at least 30 consecutive nucleotides and more preferably at least 45 consecutive nucleotides, that encode
10 a portion of a colon tumor protein. More preferably, a polynucleotide encodes an immunogenic portion of a colon tumor protein. Polynucleotides complementary to any such sequences are also encompassed by the present invention. Polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain
15 introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous
20 sequence that encodes a colon tumor protein or a portion thereof) or may comprise a variant of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as described herein.
25 Variants preferably exhibit at least about 70% identity, more preferably at least about 80% identity and most preferably at least about 90% identity to a polynucleotide sequence that encodes a native colon tumor protein or a portion thereof.

Two polynucleotide or polypeptide sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for
30 maximum correspondence as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and

compare local regions of sequence similarity. A “comparison window” as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

5 Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of
10 Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenies pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS* 5:151-153; Myers, E.W. and Muller W. (1988) *CABIOS* 4:11-17; Robinson, E.D. (1971) *Comb. Theor* 11:105; Santou, N. Nes, M.
15 (1987) *Mol. Biol. Evol.* 4:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad., Sci. USA* 80:726-730.

 Preferably, the “percentage of sequence identity” is determined by comparing
20 two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (i.e. gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequence (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is
25 calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the total number of positions in the reference sequence (i.e. the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

30 Variants may also, or alternatively, be substantially homologous to a native gene, or a portion or complement thereof. Such polynucleotide variants are capable of

hybridizing under moderately stringent conditions to a naturally occurring DNA sequence encoding a native colon tumor protein (or a complementary sequence). Suitable moderately stringent conditions include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C
5 for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

It will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to
10 differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles
15 may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Polynucleotides may be prepared using any of a variety of techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least two
20 fold greater in a colon tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena et al., *Proc. Natl. Acad. Sci. USA* 93:10614-10619, 1996 and Heller et al., *Proc. Natl. Acad. Sci. USA* 94:2150-2155, 1997). Alternatively, polypeptides may be amplified from cDNA
25 prepared from cells expressing the proteins described herein, such as colon tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion may be used to isolate a full length gene from a suitable
30 library (*e.g.*, a colon tumor cDNA library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide

probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

5 For hybridization techniques, a partial sequence may be labeled (e.g., by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (see Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring
10 Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using
15 standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences are then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full
20 length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about
25 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (see Triglia et al., *Nucl. Acids Res.* 16:8186, 1988), which uses restriction enzymes to generate a fragment in the known region of the gene. The fragment is then circularized by intramolecular ligation and
30 used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by

amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom et al., *PCR Methods Applic. 1*:111-19, 1991) and walking PCR (Parker et al., *Nucl. Acids Res. 19*:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (e.g., NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence.

Certain nucleic acid sequences of cDNA molecules encoding portions of colon tumor proteins are provided in SEQ ID NO: 1-121, 123-197 and 205-486. These polynucleotides were isolated from colon tumor cDNA libraries using conventional and/or PCR-based subtraction techniques, as described below.

Polynucleotide variants may generally be prepared by any method known in the art, including chemical synthesis by, for example, solid phase phosphoramidite chemical synthesis. Modifications in a polynucleotide sequence may also be introduced using standard mutagenesis techniques, such as oligonucleotide-directed site-specific mutagenesis (see Adelman et al., *DNA 2*:183, 1983). Alternatively, RNA molecules may be generated by *in vitro* or *in vivo* transcription of DNA sequences encoding a colon tumor protein, or portion thereof, provided that the DNA is incorporated into a vector with a suitable RNA polymerase promoter (such as T7 or SP6). Certain portions may be used to prepare an encoded polypeptide, as described herein. In addition, or alternatively, a portion may be administered to a patient such that the encoded polypeptide is generated *in vivo* (e.g., by transfecting

antigen-presenting cells, such as dendritic cells, with a cDNA construct encoding a colon tumor polypeptide, and administering the transfected cells to the patient).

A portion of a sequence complementary to a coding sequence (*i.e.*, an antisense polynucleotide) may also be used as a probe or to modulate gene expression. cDNA constructs that can be transcribed into antisense RNA may also be introduced into cells of tissues to facilitate the production of antisense RNA. An antisense polynucleotide may be used, as described herein, to inhibit expression of a tumor protein. Antisense technology can be used to control gene expression through triple-helix formation, which compromises the ability of the double helix to open sufficiently for the binding of polymerases, transcription factors or regulatory molecules (*see* Gee et al., *In Huber and Carr, Molecular and Immunologic Approaches*, Futura Publishing Co. (Mt. Kisco, NY; 1994)). Alternatively, an antisense molecule may be designed to hybridize with a control region of a gene (*e.g.*, promoter, enhancer or transcription initiation site), and block transcription of the gene; or to block translation by inhibiting binding of a transcript to ribosomes.

A portion of a coding sequence, or of a complementary sequence, may also be designed as a probe or primer to detect gene expression. Probes may be labeled with a variety of reporter groups, such as radionuclides and enzymes, and are preferably at least 10 nucleotides in length, more preferably at least 20 nucleotides in length and still more preferably at least 30 nucleotides in length. Primers, as noted above, are preferably 22-30 nucleotides in length.

Any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-, methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

Nucleotide sequences as described herein may be joined to a variety of other nucleotide sequences using established recombinant DNA techniques. For example, a polynucleotide may be cloned into any of a variety of cloning vectors, including plasmids, phagemids, lambda phage derivatives and cosmids. Vectors of particular interest include expression vectors, replication vectors, probe generation vectors and sequencing vectors. In

general, a vector will contain an origin of replication functional in at least one organism, convenient restriction endonuclease sites and one or more selectable markers. Other elements will depend upon the desired use, and will be apparent to those of ordinary skill in the art.

Within certain embodiments, polynucleotides may be formulated so as to
5 permit entry into a cell of a mammal, and expression therein. Such formulations are particularly useful for therapeutic purposes, as described below. Those of ordinary skill in the art will appreciate that there are many ways to achieve expression of a polynucleotide in a target cell, and any suitable method may be employed. For example, a polynucleotide may be incorporated into a viral vector such as, but not limited to, adenovirus, adeno-associated
10 virus, retrovirus, or vaccinia or other pox virus (*e.g.*, avian pox virus). Techniques for incorporating DNA into such vectors are well known to those of ordinary skill in the art. A retroviral vector may additionally transfer or incorporate a gene for a selectable marker (to aid in the identification or selection of transduced cells) and/or a targeting moiety, such as a gene that encodes a ligand for a receptor on a specific target cell, to render the vector target
15 specific. Targeting may also be accomplished using an antibody, by methods known to those of ordinary skill in the art.

Other formulations for therapeutic purposes include colloidal dispersion systems, such as macromolecule complexes, nanocapsules, microspheres, beads, and lipid-based systems including oil-in-water emulsions, micelles, mixed micelles, and liposomes. A
20 preferred colloidal system for use as a delivery vehicle *in vitro* and *in vivo* is a liposome (*i.e.*, an artificial membrane vesicle). The preparation and use of such systems is well known in the art.

COLON TUMOR POLYPEPTIDES

25 Within the context of the present invention, polypeptides may comprise at least an immunogenic portion of a colon tumor protein or a variant thereof, as described herein. As noted above, a "colon tumor protein" is a protein that is expressed by colon tumor cells. Proteins that are colon tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with colon cancer. Polypeptides as described
30 herein may be of any length. Additional sequences derived from the native protein and/or

heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An "immunogenic portion," as used herein is a portion of a protein that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a colon tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well known techniques. An immunogenic portion of a native colon tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ¹²⁵I-labeled Protein A.

As noted above, a composition may comprise a variant of a native colon tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native colon tumor protein in one or more substitutions, deletions, additions and/or insertions, such

that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants preferably exhibit at least about 70%, more preferably at least about 90% and most preferably at least about 95% identity (determined as described above) to the identified polypeptides.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain non-conservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (e.g., poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast and higher eukaryotic cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having fewer than about 100 amino acids, and generally fewer than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. See Merrifield, *J. Am. Chem. Soc.* 85:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A

fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing
5 fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant
10 protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that
15 the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and the second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into
20 the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred
25 peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea et al., *Gene* 40:39-46, 1985; Murphy et al., *Proc. Natl. Acad. Sci. USA* 83:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1
30 to about 50 amino acids in length. Linker sequences are not required when the first and

second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided that comprise a polypeptide of the present invention together with an unrelated immunogenic protein. Preferably the immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see, for example, Stoute et al. New Engl. J. Med.*, 336:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium *Haemophilus influenza B* (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemagglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the *LytA* gene; *Gene* 43:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid

proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology 10:795-798, 1992*). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

5 In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95%
10 pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-
15 binding fragments thereof, that specifically bind to a colon tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a colon tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a colon tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules
20 such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3
25 L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as colon cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a colon tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the
30 disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies

this requirement, biological samples (e.g., blood, sera, sputum, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. See, e.g., Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (e.g., mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (i.e., reactivity with the polypeptide of interest). Such cell lines may be produced, for example,

from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a
5 nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide.
10 Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or
15 the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of
20 antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity
25 chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y , ^{123}I , ^{125}I , ^{131}I , ^{186}Re , ^{188}Re , ^{211}At , and ^{212}Bi . Preferred drugs include methotrexate, and pyrimidine and
30 purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid.

Preferred toxins include ricin, abrin, diphtheria toxin, cholera toxin, gelonin, *Pseudomonas* exotoxin, *Shigella* toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction
5 between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

10 Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate
15 the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl
20 groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell et al.

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable
25 linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter et al.), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn et al.), by serum complement-mediated hydrolysis (*e.g.*, U.S.
30 Patent No. 4,671,958, to Rodwell et al.), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler et al.).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers which provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato et al.), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih et al.). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison et al. discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a colon tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the ISOLEX™ system, available from

Nexell Therapeutics Inc., Irvine, CA . Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

5 T cells may be stimulated with a colon tumor polypeptide, polynucleotide encoding a colon tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a colon tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

10 T cells are considered to be specific for a colon tumor polypeptide if the T cells kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen et al., *Cancer Res.* 54:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (e.g., by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a colon tumor polypeptide (100 ng/ml - 100 µg/ml, preferably 200 ng/ml - 25 µg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard cytokine assays in which a two fold increase in the level of cytokine release (e.g., TNF or IFN-γ) is indicative of T cell activation (see Coligan et al., *Current Protocols in Immunology*, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a colon tumor polypeptide, polynucleotide or polypeptide-expressing APC may be CD4⁺ and/or CD8⁺. Colon tumor protein-specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from either a patient or a related, or unrelated, donor and are administered to the patient following stimulation and expansion.

30 For therapeutic purposes, CD4⁺ or CD8⁺ T cells that proliferate in response to a colon tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro*

or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a colon tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a colon tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a colon tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS AND VACCINES

Within certain aspects, polypeptides, polynucleotides, T cells and/or binding agents disclosed herein may be incorporated into pharmaceutical compositions or immunogenic compositions (*i.e.*, vaccines). Pharmaceutical compositions comprise one or more such compounds and a physiologically acceptable carrier. Vaccines may comprise one or more such compounds and an immunostimulant. An immunostimulant may be any substance that enhances or potentiates an immune response to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and vaccines within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition or vaccine.

A pharmaceutical composition or vaccine may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems* 15:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the

necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the

5 DNA may be introduced using a viral expression system (e.g., vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch et al., *Proc. Natl. Acad. Sci. USA* 86:317-321, 1989; Flexner et al., *Ann. N.Y. Acad. Sci.* 569:86-103, 1989; Flexner et al., *Vaccine* 8:17-21, 1990; U.S. Patent Nos. 4,603,112,

10 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques* 6:616-627, 1988; Rosenfeld et al., *Science* 252:431-434, 1991; Kolls et al., *Proc. Natl. Acad. Sci. USA* 91:215-219, 1994; Kass-Eisler et al., *Proc. Natl. Acad. Sci. USA* 90:11498-11502, 1993; Guzman et al., *Circulation* 88:2838-2848, 1993; and Guzman et al., *Cir. Res.* 73:1202-1207, 1993.

15 Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer et al., *Science* 259:1745-1749, 1993 and reviewed by Cohen, *Science* 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells.

20 While any suitable carrier known to those of ordinary skill in the art may be employed in the pharmaceutical compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration.

25 For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (e.g., polylactate polyglycolate) may also be

30 employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268 and

5,075,109.

Such compositions may also comprise buffers (*e.g.*, neutral buffered saline or phosphate buffered saline), carbohydrates (*e.g.*, glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants, chelating agents such as EDTA or glutathione, adjuvants (*e.g.*, aluminum hydroxide) and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the vaccines of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bordetella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the vaccines provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN- γ , TNF α , IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of a vaccine as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Ribi ImmunoChem Research Inc. (Hamilton, MT) (see US Patent Nos. 5 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555. Another preferred adjuvant is a saponin, preferably QS21, which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a 10 monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprises an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is 15 described in WO 95/17210. Any vaccine provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient.

The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of 20 polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be prepared using well known technology and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within 25 a reservoir surrounded by a rate controlling membrane. Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be 30 treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical

compositions and vaccines to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature* 392:245-251, 1998) and have been shown to be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* 50:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency, and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine (*see* Zitvogel et al., *Nature Med.* 4:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNF α to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNF α , CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcγ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a colon tumor protein (or portion or other variant thereof) such that the colon tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition or vaccine comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi et al., *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the colon tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as colon cancer. Within such methods, pharmaceutical compositions and vaccines are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or

may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions and vaccines may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and vaccines may
5 be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as
10 polypeptides and polynucleotides disclosed herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells
15 include T cells as discussed above, T lymphocytes (such as CD8⁺ cytotoxic T lymphocytes and CD4⁺ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and
20 transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding
25 single antigen-specific effector cells to several billion in number with retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient
30 number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast and/or B cells, may be pulsed with immunoreactive

polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow *in vivo* and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see*, for example, Cheever et al., *Immunological Reviews* 157:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions disclosed herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and vaccines may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for pharmaceutical compositions and vaccines comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 μ g to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient,

but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a colon tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

METHODS FOR DETECTING CANCER

In general, a cancer may be detected in a patient based on the presence of one or more colon tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, sputum, urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as colon cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a colon tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of

the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length colon tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption, and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 μ g, and preferably about 100 ng to about 1 μ g, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see, e.g.,* Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.,* incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with colon cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

5 The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting
10 the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the
15 addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as colon cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In one preferred
20 embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to
25 the method of Sackett et al., *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value
30 that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered

positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

5 In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent
10 flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of
15 immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to
20 generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μ g, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

25 Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use colon-tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such
30 colon tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a colon tumor protein in a biological sample. Within certain methods, a biological sample comprising CD4⁺ and/or CD8⁺ T cells isolated from a patient is incubated with a colon tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with one or more representative polypeptides (*e.g.*, 5 - 25 µg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of colon tumor polypeptide to serve as a control. For CD4⁺ T cells, activation is preferably detected by evaluating proliferation of the T cells. For CD8⁺ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a colon tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a colon tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the colon tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a colon tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a colon tumor protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes will

hybridize to a polynucleotide encoding a polypeptide disclosed herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1-121, 123-197 and 205-486. Techniques for both PCR based assays and hybridization assays are well known in the art (see, for example, Mullis et al., *Cold Spring Harbor Symp. Quant. Biol.*, 51:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the disclosed compositions may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may

also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple colon tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for
5 different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

10

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or
15 equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a colon tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above
20 that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a colon tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a colon tumor protein. Such an oligonucleotide may be used, for example, within a
25 PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a colon tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLES

5

Example 1

ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY
PCR-BASED SUBTRACTION AND MICROARRAY ANALYSIS

A cDNA library was constructed in the PCR2.1 vector (Invitrogen, Carlsbad,
10 CA) by subtracting a pool of three colon tumors with a pool of normal colon, spleen, brain,
liver, kidney, lung, stomach and small intestine using PCR subtraction methodologies
(Clontech, Palo Alto, CA). The subtraction was performed using a PCR-based protocol,
which was modified to generate larger fragments. Within this protocol, tester and driver
double stranded cDNA were separately digested with five restriction enzymes that recognize
15 six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in
an average cDNA size of 600 bp, rather than the average size of 300 bp that results from
digestion with RsaI according to the Clontech protocol. This modification did not affect the
subtraction efficiency. Two tester populations were then created with different adapters, and
the driver library remained without adapters.

20 The tester and driver libraries were then hybridized using excess driver cDNA.
In the first hybridization step, driver was separately hybridized with each of the two tester
cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester
cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs, and
(d) unhybridized driver cDNAs. The two separate hybridization reactions were then
25 combined, and rehybridized in the presence of additional denatured driver cDNA. Following
this second hybridization, in addition to populations (a) through (d), a fifth population (e) was
generated in which tester cDNA with one adapter hybridized to tester cDNA with the second
adapter. Accordingly, the second hybridization step resulted in enrichment of differentially
expressed sequences which could be used as templates for PCR amplification with adaptor-
30 specific primers.

The ends were then filled in, and PCR amplification was performed using
adaptor-specific primers. Only population (e), which contained tester cDNA that did not

hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

This PCR-based subtraction technique normalizes differentially expressed cDNAs so that rare transcripts that are over-expressed in colon tumor tissue may be recoverable. Such transcripts would be difficult to recover by traditional subtraction methods.

To characterize the complexity and redundancy of the subtracted library, 96 clones were randomly picked and 65 were sequenced, as previously described. These sequences were further characterized by comparison with the most recent Genbank database (April, 1998) to determine their degree of novelty. No significant homologies were found to 21 of these clones, hereinafter referred to as 11092, 11093, 11096, 11098, 11103, 11174, 11108, 11112, 11115, 11117, 11118, 11134, 11151, 11154, 11158, 11168, 11172, 11175, 11184, 11185 and 11187. The determined cDNA sequences for these clones are provided in SEQ ID NO: 48, 49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101 and 109-111, respectively.

Two-thousand clones from the above mentioned cDNA subtraction library were randomly picked and submitted to a round of PCR amplification. Briefly, 0.5 μ l of glycerol stock solution was added to 99.5 μ l of pcr MIX (80 μ l H₂O, 10 μ l 10X PCR Buffer, 6 μ l 25 mM MgCl₂, 1 μ l 10 mM dNTPs, 1 μ l 100 mM M13 forward primer (CACGACGTTGTAAAACGACGG), 1 μ l 100 mM M13 reverse primer (CACAGGAAACAGCTATGACC)), and 0.5 μ l 5 u/ml Taq polymerase (primers provided by (Operon Technologies, Alameda, CA). The PCR amplification was run for thirty cycles under the following conditions: 95°C for 5 min., 92°C for 30 sec., 57°C for 40 sec., 75°C for 2 min. and 75°C for 5 minutes.

mRNA expression levels for representative clones were determined using microarray technology (Synteni, Palo Alto, CA) in colon tumor tissues (n=25), normal colon tissues (n=6), kidney, lung, liver, brain, heart, esophagus, small intestine, stomach, pancreas, adrenal gland, salivary gland, resting PBMC, activated PBMC, bone marrow, dendritic cells, spinal cord, blood vessels, skeletal muscle, skin, breast and fetal tissues. The number of tissue samples tested in each case was one (n=1), except where specifically noted above; additionally, all the above-mentioned tissues were derived from humans. The PCR

amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, and fluorescent-labeled cDNA probes were generated by reverse transcription according to the protocol provided by Synteni. The microarrays were probed with the labeled
5 cDNA probes, the slides scanned, and fluorescence intensity was measured. This intensity correlates with the hybridization intensity.

One hundred and forty nine clones showed two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. These cDNA clones were further characterized by DNA sequencing with a Perkin Elmer/Applied
10 Biosystems Division Automated Sequencer Model 373A and/or Model 377 (Foster City, CA). These sequences were compared to known sequences in the most recent GenBank database. No significant homologies to human gene sequences were found in forty nine of these clones, represented by the following sixteen cDNA consensus sequences: SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46 and 47, hereinafter referred to as Contig 2, 8,
15 13, 14, 20, 23, 29, 31, 35, 32, 36, 38, 41, 42, 50 and 51, respectively). Contig 29 (SEQ ID NO: 30) was found to be a Rat GSK-3- β -interacting protein Axil homolog. Also, Contigs 31 and 35 (SEQ ID NO: 32 and 33, respectively) were found to be a Mus musculus GOB-4 homolog. The determined cDNA sequences of SEQ ID NO: 1, 3-7, 9-14, 17-21, 23, 25-29, 31, 35, 37, 39, 42-45, 50, 51, 53, 55-58, 61-64, 70-78, 80-88, 91, 92, 94-98, 102-108 and 112
20 were found to show some homology to previously identified genes sequences.

Microarray analysis demonstrated Contig 2 (SEQ ID NO: 2) showed over-expression in 34% of colon tumors tested, as well as increased expression in normal pancreatic tissue, with no over-expression in normal colon tissues. Upon further analysis, Contigs 2, 8 and 23 were found to share homology to the known gene GW112. Contigs 4, 5,
25 9 and 52 showed homology to carcinoembryonic antigen (SEQ ID NO: 3, 4, 5 and 6, respectively). A representative sampling of these fragments showed over-expression in 85% of colon tumors, with over-expression in normal bone marrow and 3/6 normal colon tissues. Contig 6 (SEQ ID NO: 7), showing homology to the known gene sequence for villin, and was over-expressed in about half of all colon tumors tested, with a limited degree of low level
30 over-expression in normal colon. Contig 12 (SEQ ID NO: 14), showing homology to Chromosome 17, clone hRPC.1171_I_10, also referred to as C798P, was over-expressed in

approximately 70% of colon tumors tested, with low over-expression in 1/6 normal colon samples. Contig 14, also referred to as 14261 (SEQ ID NO: 16), showing no significant homology to any known gene, showed over-expression in 44% of colon tumors tested, with low level expression in half of normal colon tissues, as well as small intestine and pancreatic tissue. Contig 18 (SEQ ID NO: 21), showing homology to the known gene for L1-cadherin, showed over-expression in approximately half of colon tumors and low level over-expression in 3/6 normal colon tissues tested. Contig 22 (SEQ ID NO: 23), showing homology to Bumetanide-sensitive Na-K-Cl cotransporter was over-expressed in 70% of colon tumors and no over-expression in all normal tissues tested. Contig 25 (SEQ ID NO: 25), showing homology to macrophage inflammatory protein-3 α , was over-expressed in over 40% of colon tumors and in activated PBMC. Contigs 26 and 48 (SEQ ID NOS: 25 and 26), showing homology to the sequence for laminin, was over-expressed in 48% of colon tumors and with low over-expression in stomach tissue. Contig 28 (SEQ ID NO: 29), showing homology to the known gene sequence for Chromosome 16 BAC clone CIT987SK-A-363E6, was over-expressed in 33% of colon tumors tested with normal stomach and 2/6 normal colon tissues showing low level over-expression. Contigs 29, 31 and 35 (SEQ ID NOS: 30, 32 and 33, respectively), also referred to as C751P, an unknown sequence showing limited and partial homology to Rat GSK-3 β -interacting protein Axil homolog and Mus musculus GOB-4 homolog, was over-expressed in 74% of colon tumors and no over-expression in all normal tissues tested. Contig 34 (SEQ ID NO: 35), showing homology to the known sequence for desmoglein 2, was over-expressed in 56% of colon tumors and showed low level over-expression in 1/6 normal colon tissues. Contig 36 (SEQ ID NO: 36), an unknown sequence also referred to as C793P, showed over-expression in 30% of colon tumor tissues tested. Contig 37 and 14287.2 (SEQ ID NOS: 37 and 116), an unknown sequence, but with limited (89%) homology to the known sequence for putative transmembrane protein was over-expressed in 70% of colon tumors, as well as in normal lung tissue and 3/6 normal colon tissues tested. Contig 38, also referred to as C796P and 14219 (SEQ ID NO: 38), showing no significant homology to any known gene, was over-expressed in 38% in colon tumors and no elevated over-expression in any normal tissues. Contig 41 (SEQ ID NO: 40), also referred to as C799P and 14308, an unknown sequence showing no significant homology to any known gene, was over-expressed in 22% of colon tumors. Contig 42, (SEQ ID NO: 41), also

referred to as C794P and 14309, an unknown sequence with no significant homology to any known gene, was over-expressed in 63% of colon tumors tested, as well as in 3/6 normal colon tissues. Contig 43 (SEQ ID NO: 42), showing homology to the known sequence for Chromosome 1 specific transcript KIAA0487 was over-expressed in 85% of colon tumors
5 tested and in normal lung and 4/6 normal colon tissues. Contig 49 (SEQ ID NO: 45), showing homology to the known sequence for pump-1, was over-expressed in 44% of colon tumors and no over-expression in all normal tissues tested. Contig 50 (SEQ ID NO: 46), also referred to as C792P and 18323, showing no significant homology to any known gene, was over-expressed in 33% of colon tumors with no detectable over-expression in any normal
10 tissues tested. Contig 51 (SEQ ID NO: 47), also referred to as C795P and 14317 was over-expressed in 11% of colon tumors.

Additional microarray analysis yielded seven clones showing two or more fold over-expression in the colon tumor probe group as compared to the normal tissue probe group. Three of these clones demonstrated particularly good colon tumor specificity, and are
15 represented by SEQ ID NO: 115, 116 and 120. Specifically, SEQ ID NO: 115, referred to as C791P or 14235, which shows homology to the known gene sequence for H. sapiens chromosome 21 derived BAC containing ets-2 gene, was over-expressed in 89% of colon tumors tested and in 5/6 normal colon tissues, as well as over-expressed at low levels in normal lung and activated PBMC. Microarray analysis for SEQ ID NO: 116 is discussed
20 above. SEQ ID NO: 120, referred to as 14295, showing homology to the known gene sequence for secreted cement gland protein XAG-2 homolog, was over-expressed in 70% of colon tumors and in 5/6 normal colon tissues, as well as low level over-expression in normal small intestine, stomach and lung. All clones showing over-expression in colon tumor were sequenced and these sequences compared to the most recent Genbank database (February 12,
25 1999). Of the seven clones, three contained sequences that did not share significant homology to any known gene sequences, represented by SEQ ID NO: 116, 117 and 119. To the best of the inventors' knowledge, none of these sequences have been previously shown to be present in colon. The determined cDNA sequences of the remaining clones (SEQ ID NO: 113-115 and 120) were found to show some homology to previously identified genes.

30 Further analysis identified a clone which was recovered several times by PCR subtraction and by expression screening using a mouse anti-scld antiserum. The determined

full length cDNA sequence for this clone is provided in SEQ ID NO: 121, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 122. This clone is homologous with the known gene Beta IG-H3, as disclosed in U.S. Patent No. 5,444,164. Microarray analysis demonstrated this clone to be over-expressed in 75 to 80% of colon tumors tested (n=27), with no over-expression in normal colon samples (n=6), but with some low level over-expression in other normal tissues tested.

Further analysis of the PCR-subtraction library described above led to the isolation of longer cDNA sequences for the clones of SEQ ID NO: 30, 115, 46, 118, 41, 47, 38, 113, 14 and 40 (known as C751P, C791P, C792P, C793P, C794P, C795P, C796P, C797P, C798P and C799P, respectively). These determined cDNA sequences are provided in SEQ ID NO: 123-132, respectively.

Using PCR subtraction methodology described above with minor modifications, transcripts from a pool of three moderately differentiated colon adenocarcinoma samples were subtracted with a set of transcripts from normal brain, pancreas, bone marrow, liver, heart, lung, stomach and small intestine. Modifications of the above protocol were included at the cDNA digestion steps and in the tester to drive hybridization ratios. In a first subtraction, the restriction enzymes PvuII, DraI, MscI and StuI were used to digest cDNAs, and the tester to driver ratio was 1:40, as suggested by Clontech. In a second subtraction, DraI, MscI and StuI were used for cDNA digestion and a tester to driver ratio of 1:76 was used. Following the PCR amplification steps, the cDNAs were clones into pCR2.1 plasmid vector. The determined cDNA sequences of 167 isolated clones are provided in SEQ ID NO: 205-371. These sequences were compared to sequences in the public databases as described above. The sequences of SEQ ID NO: 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369 and 371 were found to show some homology to previously identified ESTs. The remaining sequences were found to show some homology to previously identified genes.

Using the PCR subtraction technology described above, a cDNA library from a pool of primary colon tumors was subtracted with a cDNA library prepared from normal tissues, including brain, bone marrow, kidney, heart, lung, liver, pancreas, small intestine,

stomach and trachea. The determined cDNA sequences for 90 clones isolated in this subtraction are provided in SEQ ID NO: 372-461. Comparison of these sequences with those in the public databases as described above, revealed no homologies to the sequences of SEQ ID NO: 426, 445 and 453. The sequences of SEQ ID NO: 372-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455 and 457-461 showed some homology to previously identified genes, while the sequences of SEQ ID NO: 379, 405, 407, 408, 418, 424, 430-432, 437, 442, 444, 452 and 456 showed some homology to previously isolated ESTs.

Example 2

ISOLATION OF TUMOR POLYPEPTIDES USING SCID-PASSAGED TUMOR RNA

Human colon tumor antigens were obtained using SCID mouse passaged colon tumor RNA as follows. Human colon tumor was implanted in SCID mice and harvested, as described in Patent Application Serial No. 08/556,659 filed 11/13/95, U.S. Patent No. 5,986,170 . First strand cDNA was synthesized from poly A+ RNA from three SCID mouse-passaged colon tumors using a Lambda ZAP Express cDNA synthesis kit (Stratagene). The reactions were pooled and digested with RNase A, T1 and H to cleave the RNA and then treated with NaOH to degrade the RNA. The resulting cDNA was annealed with biotinylated (Vector Labs, Inc., Burlingame, CA) cDNA from a normal resting PBMC plasmid library (constructed from Superscript plasmid System, Gibco BRL), and subtracted with streptavidin by phenol/chloroform extraction. Second strand cDNA was synthesized from the subtracted first strand cDNA and digested with S1 nuclease (Gibco BRL). The cDNA was blunted with Pfu polymerase and EcoRI adaptors (Stratagene) were ligated to the ends. The cDNA was phosphorylated with T4 polynucleotide kinase, digested with restriction endonuclease XhoI, and size selected with Sephacryl S-400 (Sigma). Fractions were pooled, ligated to Lambda ZAP Express arms (Stratagene) and packaged with Gigapack Gold III extract (Stratagene). Random plaques were picked, phagemid was excised, transformed into XL0LR cells (Stratagene) and resulting plasmid DNA (Qiagen Inc., Valencia, CA) was sequenced as described above. The determined cDNA sequences for 17

clones isolated as described above are provided in SEQ ID NO: 133-151, wherein 133 and 134 represent partial sequences of a clone referred to as CoSub-3 and SEQ ID NO: 135 and 136 represent partial sequences of a clone referred to as CoSub-13. These sequences were compared with those in the public databases as described above. The sequences of SEQ ID NO: 139 and 149 showed no significant homologies to any previously identified sequences. The sequences of SEQ ID NO: 138, 140, 141, 142, 143, 148 and 149 showed some homology to previously isolated expressed sequence tags (ESTs). The sequences of SEQ ID NO: 133-137, 144-147, 150 and 151 showed some homology to previously isolated gene sequences.

Example 3

USE OF MOUSE ANTISERA TO IDENTIFY DNA SEQUENCES ENCODING COLON TUMOR ANTIGENS

This example illustrates the isolation of cDNA sequences encoding colon tumor antigens by screening of colon tumor cDNA libraries with mouse anti-tumor sera.

A cDNA expression library was prepared from SCID mouse-passaged human colon tumor poly A+ RNA using a Stratagene (La Jolla, CA) Lambda ZAP Express kit, following the manufacturer's instructions. Sera was obtained from the colon tumor-bearing SCID mouse. This serum was injected into normal mice to produce anti-colon tumor serum. Approximately 600,000 PFUs were screened from the unamplified library using this antiserum. Using a goat anti-mouse IgG-A-M (H+L) alkaline phosphatase second antibody developed with NBT/BCIP (BRL Labs.), positive plaques were identified. Phage was purified and phagemid excised for several clones with inserts in a pBK-CMV vector for expression in prokaryotic or eukaryotic cells.

The determined cDNA sequences for 46 of the isolated clones are provided in SEQ ID NO: 152-197. The predicted amino acid sequences for the cDNA sequences of SEQ ID NO: 187, 188, 189, 190, 194, 195 and 197 are provided in SEQ ID NO: 198-204, respectively. The determined cDNA sequences were compared with those in the public database as described above. The sequences of SEQ ID NO: 156, 168, 184, 189, 192 and 196 showed some homology to previously isolated ESTs. The sequences of SEQ ID NO: 152-

155, 157-167, 169-182, 183, 185-188, 190, 194, 195 and 197 showed some homology to previously identified genes.

Example 4

5 ISOLATION AND CHARACTERIZATION OF COLON TUMOR POLYPEPTIDES BY CONVENTIONAL SUBTRACTION

Two cDNA libraries were constructed and used to create a subtracted cDNA library as follows.

10 Using the GibcoBRL Superscript Plasmid System with minor modifications, two cDNA libraries were created. The first library, referred to as CTCL, was prepared from a pool of mRNA samples from three colon adenocarcinoma tissue samples. Two of the samples were described as Duke's stage C and one as Duke's stage B. All three samples were grade III in histological status. A second library (referred to as DriverLibpcDNA3.1+)
15 was prepared from a pool of normal tissues, namely liver, pancreas, skin, bone marrow, resting PBMC, stomach and brain. Both libraries were prepared using the manufacturer's instructions with the following modifications: an EcoRI-NotI 5' cDNA adapter was used instead of the provided reagent; the vector pCDNA3.1(+) (Invitrogen) was substituted for the pSPORT vector; and the ligated DNA molecules were transformed into ElectroMaxDH10B
20 electrocompetent cells. Clones from the libraries were analyzed by restriction digest and sequencing to determine average insert size, quality of the library and complexity of the library. DNA was prepared from each library and digested.

The driver DNA was biotinylated and hybridized with the colon library tester DNA at a ratio of 10:1. After two rounds of hybridizations, streptavidin incubations and
25 extractions, the remaining colon cDNAs were size-selected by column chromatography and cloned into the pCMV-Script vector from Stratagene. Clones from this subtracted library (referred to as CTCL-S1) were characterized as described above for the unsubtracted libraries.

The determined cDNA sequences for 18 clones isolated from the CTCL-S1 library are provided in SEQ ID NO: 462-479. Comparison of these sequences with those in
30 the public databases, as described above, revealed no significant homologies to the sequences

of SEQ ID NO: 476, 477 and 479. The remaining sequences showed some homology to previously identified genes.

In further studies, a cDNA library was prepared from a pool of mRNA from three metastatic colon adenocarcinomas derived from liver tissue samples. All samples were described as Duke's stage D. Conventional subtraction was performed as described above, using the DriverLibpcDNA3.1+ library described above as the driver. The resulting subtracted library (referred to as CMCL-S1) was characterized by isolating a set of clones for restriction analysis and sequencing.

The determined cDNA sequences for 7 clones isolated from the CMCL-S1 library are provided in SEQ ID NO: 480-486. Comparison of these sequences with those in the public databases revealed no significant homologies to the sequence of SEQ ID NO: 483. The sequences of SEQ ID NO: 480-482 and 484-486 were found to show some homology to previously identified genes.

Example 5

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using Fmoc chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

CLAIMS

1. An isolated polypeptide comprising at least an immunogenic portion of a colon tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483;

(b) sequences that hybridize to a sequence of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 under moderately stringent conditions; and

(c) a complement of a sequence of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168,

170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 5 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NO: 122 and 198-204.

10 4. An isolated polynucleotide encoding at least 15 amino acid residues of a colon tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of 15 SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 20 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a colon tumor protein, or a variant 25 thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 30 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303,

310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing sequences.

5 6. An isolated polynucleotide comprising a sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279,
10 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483.

 7. An isolated polynucleotide comprising a sequence that hybridizes to a
15 sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320,
20 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 under moderately stringent conditions.

 8. An isolated polynucleotide complementary to a polynucleotide
25 according to any one of claims 4-7.

 9. An expression vector comprising a polynucleotide according to any one of claims claim 4-8.

30 10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a colon tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250, 253, 254, 256, 259, 260, 262, 263, 266, 267, 270-273, 279, 282, 291, 293, 294, 298, 300, 302, 303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455, 457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotide sequences.

12. A fusion protein comprising at least one polypeptide according to claim 1.

13. A fusion protein according to claim 12, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

14. A fusion protein according to claim 12, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

15. A fusion protein according to claim 12, wherein the fusion protein comprises an affinity tag.

16. An isolated polynucleotide encoding a fusion protein according to claim 12.

17. A pharmaceutical composition comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:

- 5 (a) a polypeptide according to claim 1;
(b) a polynucleotide according to claim 4;
(c) an antibody according to claim 11;
(d) a fusion protein according to claim 12; and
(e) a polynucleotide according to claim 16.

18. A vaccine comprising an immunostimulant and at least one component selected from the group consisting of:

- 10 (a) a polypeptide according to claim 1;
(b) a polynucleotide according to claim 4;
(c) an antibody according to claim 11;
(d) a fusion protein according to claim 12; and
(e) a polynucleotide according to claim 16.

15 19. A vaccine according to claim 18, wherein the immunostimulant is an adjuvant.

20 20. A vaccine according to any claim 18, wherein the immunostimulant induces a predominantly Type I response.

21. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 17.

25 22. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a vaccine according to claim 20.

30 23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. A vaccine comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with an immunostimulant.

26. A vaccine according to claim 25, wherein the immunostimulant is an adjuvant.

27. A vaccine according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. A vaccine according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide encoded by a polynucleotide recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486, and thereby inhibiting the development of a cancer in the patient.

30. A method according to claim 29, wherein the antigen-presenting cell is a dendritic cell.

31. A method according to any one of claims 21, 22 and 29, wherein the cancer is colon cancer.

32. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-

197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

5

33. A method according to claim 32, wherein the biological sample is blood or a fraction thereof.

34. A method for inhibiting the development of a cancer in a patient,
10 comprising administering to a patient a biological sample treated according to the method of claim 50.

35. A method for stimulating and/or expanding T cells specific for a colon tumor protein, comprising contacting T cells with at least one component selected from the
15 group consisting of:

- (i) a polypeptide according to claim 1;
- (ii) a polypeptide encoded by a polynucleotide comprising a sequence provided in any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- 20 (iv) an antigen presenting cell that expresses a polypeptide of (i) or (ii),
under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

36. An isolated T cell population, comprising T cells prepared according to
25 the method of claim 35.

37. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 36.

30

38. A method for inhibiting the development of a cancer in a patient,

comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- 5 (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iv) an antigen-presenting cell that expresses a polypeptide of (i) or
- 10 (ii);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

15 39. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating CD4⁺ and/or CD8⁺ T cells isolated from a patient with at least one component selected from the group consisting of:

- (i) a polypeptide according to claim 1;
- 20 (ii) a polypeptide encoded by a polynucleotide comprising a sequence of any one of SEQ ID NO: 1-121, 123-197 and 205-486;
- (iii) a polynucleotide encoding a polypeptide of (i) or (ii); and
- (iii) an antigen-presenting cell that expresses a polypeptide of (i) or
- 25 (ii);

such that T cells proliferate;

(b) cloning at least one proliferated cell to provide cloned T cells; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

30

40. A method for determining the presence or absence of a cancer in a

patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

5 (i) polynucleotides recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486; and

(ii) complements of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

10 (c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

41. A method according to claim 40, wherein the binding agent is an antibody.

15

42. A method according to claim 43, wherein the antibody is a monoclonal antibody.

43. A method according to claim 40, wherein the cancer is colon cancer.

20

44. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

25 (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

30 (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

45. A method according to claim 44, wherein the binding agent is an
5 antibody.

46. A method according to claim 45, wherein the antibody is a monoclonal antibody.

10 47. A method according to claim 44, wherein the cancer is a colon cancer.

48. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an
15 oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;

(b) detecting in the sample an amount of a polynucleotide that hybridizes
20 to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

25 49. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

50. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

30

51. A method for monitoring the progression of a cancer in a patient,

comprising the steps of:

- (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a colon tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1-121, 123-197 and 205-486 or a complement of any of the foregoing polynucleotides;
- (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;
- (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and
- (d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

52. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

53. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

54. A diagnostic kit, comprising:

- (a) one or more antibodies according to claim 11; and
- (b) a detection reagent comprising a reporter group.

55. A kit according to claim 54, wherein the antibodies are immobilized on a solid support.

56. A kit according to claim 54, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

57. A kit according to claim 54, wherein the reporter group is selected

from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

58. An oligonucleotide comprising 10 to 40 contiguous nucleotides that
5 hybridize under moderately stringent conditions to a polynucleotide that encodes a colon
tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded
by a polynucleotide sequence recited in any one of SEQ ID NO: 2, 8, 15, 16, 22, 24, 30, 32-
34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111, 116-119,
123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205, 207, 210-
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310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-378,
380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454, 455,
457-461, 476, 477, 479 and 483 or a complement of any of the foregoing polynucleotides.

15

59. A oligonucleotide according to claim 58, wherein the oligonucleotide
comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 2, 8, 15, 16, 22,
24, 30, 32-34, 36, 38, 40, 41, 46-49, 52, 54, 59, 60, 65-69, 79, 89, 90, 93, 99-101, 109-111,
116-119, 123-132, 138-142, 143, 148, 149, 156, 168, 170-182, 184, 189, 191-193, 196, 205,
20 207, 210-212, 214, 215, 218, 224-226, 228, 233, 234, 236, 238, 241, 242, 245, 246, 248, 250,
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303, 310-313, 315, 317, 320, 322, 324, 332-335, 345, 347, 356, 358, 361, 362, 366, 369, 371-
378, 380-404, 406, 409-417, 419-423, 425, 427-429, 433-436, 438-441, 443, 446-451, 454,
455, 457-461, 476, 477, 479 and 483.

25

60. A diagnostic kit, comprising:
(a) an oligonucleotide according to claim 59; and
(b) a diagnostic reagent for use in a polymerase chain reaction or
hybridization assay.

SEQUENCE LISTING

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<120> COMPOUNDS FOR IMMUNOTHERAPY AND
DIAGNOSIS OF COLON CANCER AND METHODS FOR THEIR USE

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aacattgctg	caaaatgaac	acacttttag	acacccctgc	agatatctaa	gtaagtggag	540
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gcttctgcaa	gacagaaa	tcataattca	gaaggtaacc	atcgctatag	acataaagtt	660
tctggtcaaa	aggggttatag	ttaatgctct	gcactttttc	ctgcatctta	tgcattacaa	720
tgtctagttt	gcctctcttc	cctgtgtttg	tgtcataata	gtaaaaaatc	tcttctgttc	780
tggtgtttca	tagtacgggt	ggcatacaga	acccacata	ccatgaaggc	gttagaagca	840
gatggtttat	actgcttggt	ataccaagtg	tttagcacct	gaagtgtggg	gtcattgagt	900
ttactaatca	ccatgttacc	agtgtgtggt	tcagttgaat	aaataaccca	caatccattc	960
tcattccacag	caaagtcaat	atcttgccaa	gcaacattag	catatgaaaa	gcggttatta	1020
taggcagcat	tagggagagt	ttgagtcaca	gcaatcgtgt	tggtggtcag	gttaactctg	1080
gcaatattcc	cggtgttgta	catgttgacg	tacatgttgt	tgttgtaaac	tgctgtacca	1140
ctaccttga	c					1151

<210> 9

<211> 604

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(604)

<223> n = A,T,C or G

<400> 9

ctgtgcaagg	gctttacaaa	aactgtgcc	ggacttccca	tgaggctgga	ttgcttgatt	60
catgttttat	gagccccaca	atactgaagc	tccttttcca	gggacttggc	ataggcagtc	120
aattccacat	ttgggatagg	tcctctctgg	aagtgaatgt	caggcagtga	catccaagtt	180
tctgcatgca	gtgggttaac	agccatgttt	agggggaaca	tgatttaaaa	agtacatctc	240

```

tctccctcct cccccacatg cacaaggctc acatctcatt atgggtgkcg cccatgtcac 300
attaaaagtgt gatacttkgg ttttgaaaac attcaaacag tctctgtgga aatctggaga 360
gaaattggcg gagagctgcc gtggtgcatt cctcctgtag tgcttcaagn taatgcttca 420
tcctttntta ataacttttg atagacaggg gctagtcgca cagacctctg ggaagccctg 480
gaaaacgctg atgcttggtt gaagatctca agcgagagt ctgcaagttc atccctctt 540
tcctgaggtc tggttggtgg aggctgcaga acattggtga tgacatggac cacgccattt 600
gtgg 604

```

```

<210> 10
<211> 473
<212> DNA
<213> Homo sapien

```

```

<400> 10
tcgagaagat ccctagtgg actttgaacc gtatcctggg cgacccagaa gccctgagag 60
acctgctgaa caaccacatc ttgaagtcag ctatgtgtgc tgaagccatc gttgcggggc 120
tgtctgtgga gacctggag ggcacgacac tggaggtggg ctgcagcggg gacatgctca 180
ctatcaacgg gaaggcgatc atctccaata aagacatcct agccaccaac ggggtgatcc 240
actacattga tgagctactc atcccagact cagccaagac actatttgaa ttggtgcag 300
agtctgatgt gtccacagcc attgaccttt tcagacaagc cggcctcggc aatcatctct 360
ctgggaagtga gcggttgacc ctctgggct ccctgaatt ctgtattcaa agatggaacc 420
cctccaattg atgcccatac aaggaatttg cttcggaacc acataattaa aga 473

```

```

<210> 11
<211> 411
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(411)
<223> n = A,T,C or G

```

```

<400> 11
tcttcattgg tcggggccaa aagcgtgtac tggccgttac cttcaagcat cgtgttgagc 60
cctgatgcag ccacagcagc ccgaagggtc tcaaagggtg cctcgatctc aatgatctgc 120
tgatgttgt tggtgatggt ggagatgacc ttatcgatga ggtgcaccac cccgttggtt 180
gcatgggtgt cggcttlyar carccgggca cagttcacag ttacaatccc attagatag 240
tggtggatct nggatgttg aattcttgta catagnaggt gaggggtcat gccctgttt 300
cagtcctca gtcaggactc gcctgcccac catatggtaa gcsgragggc atttgagcag 360
ctcaatgttt gacattgctg gaccagggga gttccagcac ttctangang a 411

```

```

<210> 12
<211> 560
<212> DNA
<213> Homo sapien

```

```

<400> 12
tacttgctg gagatwgcyt tykckwmtg ytcwrawgtc cgtggataca gaaatctctg 60
caggcaagtt gctccagagc atattgcagg acaagcctgt aacgaatagt taaattcacg 120
gcatctggat tcctaactc tttccgaaat ggcagggtgt agtgctgta taaaatattc 180
tatgtttacc ttcaacttct tgttctggct atgtggtatc ttgatcctag cattagcaat 240
atgggtacga gtaagcaatg actctcaagc aatttttggg tctgaagatg taggctctag 300
ctcctacgtt gctgtggaca tattgattgc tgtaggtgcc atcatcatga ttctgggctt 360
cctgggatgc tgcggtgcta taaaagaaag tcgctgcatg cttctgttgt ttttcatagg 420

```

cttgcttctg atcctgctcc tgcaggtggg cgacaggtat cctaggagct gttttcaa	480
ctaagtctga tcgcattgtg aatgaaactc tctatgaaaa cacaagctt ttgagcgcca	540
caggggaaag tgaaaaacaa	560

<210> 13
 <211> 150
 <212> DNA
 <213> Homo sapien

<400> 13	
gggcaggctg tcttttttaa atgtctcggc tagctagacc acagatatct tctagacata	60
ttgaacacat ttaagatttg agggatataa gggaaaatga tatgaatgtg tatttttact	120
caaaataaaa gtaactgttt acgttgggtga	150

<210> 14
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 14	
ctgctgcctg tggcgtgtgt gggctggatc ccttgaaggc tgagtttttg agggcagaaa	60
gctagctatg ggtagccagg tgttaciaaag gtgctgctcc ttctccaacc cctacttgg	120
ttccctcacc ccaagcctca tgttcatacc agccagtggg ttcagcagaa cgcagtacac	180
cttatcacct ccttccttgg gtgagctctg aacaccagct ttggccctc cacagtaagg	240
ctgctacatc aggggcaacc ctggctctat cattttcctt ttttgccaaa aggaccagta	300
gcataggtga gccctgagca ctaaaaggag gggtccttga agctttccca ctatagtgtg	360
gagttctgtc cctgaggtgg gtacagcagc ct.tggttctc ctg	403

<210> 15
 <211> 688
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (688)
 <223> n = A,T,C or G

<400> 15	
caaagcacat tttaatcatt tatttttaaaa gggggagtaa agcattttaa ctgccaatcc	60
tatagactag gacttgaaca tcaaaggaaa aatagacaaa gactagatga taaagtcatt	120
caaaagcaca gaagcacatc acatacacca gcaaggtttc caactactgc actgattaac	180
tagatactct caatagcttt tctatagctc gtcctagaaa aaaaaattaa attttcattt	240
tcttacaagt tccaggctta aacaaaggca aaaattacat gcaacaactg atacactcat	300
aagttgcaca tatgtctcaa ggtctttatt agataacaat aaatgctagc actttgtcac	360
tgccatcaga ttttccttat agtcttagag tcatgtaaat aaaagttcca taatgaaatt	420
aaagaaaatt aatttttcta atcttagatc agttccatag aaaactatta atttttttaa	480
agtaggcagt agaagggggg tgggtggggg tggaattggg tagtaagtct ggttctaate	540
ttctgagctg cctttggaag gaagttatga ggtagaagat tctactgact tttagtaagg	600
tggaacaatga gagaaaagaa aaagcagggt cctcatcnnc agatccttnt ggtatttatn	660
tgccangtnc nanntaatnc atanaaag	688

<210> 16
 <211> 408
 <212> DNA

<213> Homo sapien

<400> 16

caggtcatca	agatgactta	caggatgtaa	tagggagagc	tgtcgagatt	ggtgttaaaa	60
agtttatgat	tacaggtgga	aatctacaag	acagtaaaga	tgcactgcat	ttggcacaaa	120
caaatggtat	gtttttcagt	acagttggat	gtcgtcctac	aagatgtggt	gaatttgaaa	180
agaataaccc	tgatctttac	ttaaaggagt	tgctaaatct	tgctgaaaac	aataaaggga	240
aagttgtggc	aataggagaa	tgcggaactg	attttgaccc	gactgcagtt	ttgtcccaaa	300
gatactcaac	tcaaatatct	tgaaaaacag	tttgaactgt	cagaacaaac	aaaattacca	360
atgtttcttc	attgtccgaa	actcacatgc	tgaatttttg	gacataat		408

<210> 17

<211> 407

<212> DNA

<213> Homo sapien

<400> 17

ggtcctgggg	aggccctagg	ggagcaccgt	gatggagagg	acagagcagg	ggctccagca	60
ccttctttct	ggactggcgt	tcacctccct	gtcagtgct	tgggctccac	gggcaggggt	120
cagagcactc	cctaatttat	gtgctatata	aatatgtcag	atgtacatag	agatctatct	180
tttctaaaac	attccctctc	ccactcctct	cccacagagt	gctggactgt	tccaggccct	240
ccagtgggct	gatgctggga	cccttaggat	ggggctccca	gctcctttct	cctgtgaatg	300
gaggcagaag	acctccaata	aagtgccttc	tgggcttttt	ctaacccttg	tcttagctac	360
ctgtgtactg	aaatttgggc	ctttggatcg	aatatggtca	agaggtt		407

<210> 18

<211> 405

<212> DNA

<213> Homo sapien

<400> 18

tgaagagtca	acttgggcct	ggaggactga	taaagtttgt	gattttgagg	gcctctaaaa	60
gtattaaagc	agcggcagcc	gctgcacgca	gacatgaggg	ctagggttaa	acagtaagat	120
caagttgttt	ggacagaaa	gctacagagt	gtggctcctg	ctcttggtga	agaattacga	180
ccacgctaac	catgcctagg	aaggaaagga	gttattgttt	tgtagaaagg	tgctgggggt	240
tgagagatca	gtcggacacg	attggcaggg	agagcacgtg	tggtttttatg	agaattatgc	300
ccgagatagg	taacagatga	ggaagaaatt	tgggcttgat	tgaagtaatg	ggggctgtct	360
gtgaagcttt	gcagcagtag	agcctaggtg	atttgctgag	cctaa		405

<210> 19

<211> 401

<212> DNA

<213> Homo sapien

<400> 19

tcctgacatt	cctgccttct	tatattaata	agacaaataa	aacaaaatag	tgttgaagtg	60
ttggggcagc	gaaaattttt	gggggggtgt	atggagagat	aatgggcat	gtttctcagg	120
gctgcttcaa	gcgggattag	gggcggcgtg	ggagcctaga	gtgggagaga	ttaagctgaa	180
gggaggtctt	gtggttaagg	gtgatatcat	ggggatgtta	gaagaaacat	ttgtcgtata	240
gaatgattgg	tgatggcctg	gatacgggtt	tggatgattt	gagaagctaa	atggaagata	300
caaggtccga	ataaaaggag	gagaaaaatg	ggtattaaat	gtctaagaat	tgggaggacc	360
taggacatct	gattagagag	tgccctaagg	gattcagcat	a		401

<210> 20

<211> 331

<212> DNA

<213> Homo sapien

<400> 20

aggtcagct	ctgtctcata	cttgactcta	aagtcacag	cagcaagacg	ggcattgtca	60
atctgcagaa	cgatgcgggc	attgtccaca	gtatttgca	agatctgagc	cctcaggtcc	120
tcgatgatct	tgaagtaatg	gctccagtct	ctgacctggg	gtcccttctt	ctccaagtgc	180
tcccggattt	tgtctccag	cctccggttc	tcggtctcca	ggctcctcac	tctgtccagg	240
taagaggcca	ggcggtcgtt	caggctttgc	atggtctcct	tctcgttctg	gatgcctccc	300
attcctgcc	gacccccggc	tatccccggtg	g			331

<210> 21

<211> 346

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(346)

<223> n = A,T,C or G

<400> 21

ggtcaccac	ttgtaccga	tatggacttc	cggtctctct	gtccaatgga	gccacactaa	60
agatctcacc	agtcacgtgg	tcaattttaa	gccaacctct	tgtgtctccc	ctcagtgaat	120
agcttatgtc	cagaccttct	ggatccttgg	cagtcacatt	gcccacttta	gtgcctatag	180
ctacatcctc	actgactttc	gcttgggaata	cgtgttggga	aaattgaggt	gcttcattca	240
catctgtcac	aataagncgt	gaacttggca	aaagaacttg	cattgtactt	cacaccaaac	300
actagaggct	caggattttc	tgctttgaac	acaatggttg	aaacag		346

<210> 22

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 22

gaagactccc	tctctcgga	gccggatccc	gagccgggca	ggatggatca	ccaccagccg	60
gggactgggc	gctaccaggt	gcttcttaat	gaagaggata	actcagaatc	atcggctata	120
gagcagccac	ctacttcaaa	cccagcacc	gcagattgtg	caggctgcgt	cttcagcacc	180
agcacttgaa	actgactctt	cccctccacc	atatagtagt	attactggtg	gaagtaccta	240
caacttcaga	tacagaagtt	tacggtgagt	tttatcccgt	gccacctccc	tatagcgttg	300
ctacctctct	tcctacnwt	cgatgaaagc	tgagaaggct	aaagctgctg	caatggcatg	360

<210> 23

<211> 251

<212> DNA

<213> Homo sapien

<400> 23

ggcggagctc	cacgacgagc	tggaaaagga	acctttttgag	gatggctttg	caaattgggga	60
agaaagtact	ccaaccagag	atgctgtggt	cacgtatact	gcagaaagta	aaggagtcgt	120

```

gaagtttggc tggatcaagg gtgtattagt acgttgtagt ttaaacattt ggggtgtgat   180
gcttttcatt agattgtcat ggattgtggg tcaagctgga ataggtctat cagtccttgt   240
aataatgatg g                                     251

```

<210> 24

<211> 421

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(421)

<223> n = A,T,C or G

<400> 24

```

caggtctttc ccaggtgttg actccagctc cagcttcagc tccagctcca ggtcgggctc   60
cagctccagc cgcagcttar gcagcgggag gttctgtgtc ccagttgttt tccaatttca   120
ccggctcccg tggatgamcg ygggacctgy caswgctcct gktycctgc yagsacacca   180
cnytttyccg tggacacrar kggaaackct tggaaattcac agctyatgtt ctttctcara   240
agtttgagaa agaactttct aaagtgaggg aatatgtcca attaattagt gtgtatgaaa   300
agaaactgtt aaacctaact gtccgaattg acatcatgga raaaggatac catttcttac   360
actgaactgg acttcgagct gatcaaggta gaagtgaagg agatggaaaa actggtcata   420
c                                     421

```

<210> 25

<211> 381

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(381)

<223> n = A,T,C or G

<400> 25

```

gaactttttg tttcttttatt ttcaatattt gtcttattaa tatttttctt attttataat   60
gcaattacaa caatttagga nacaaaacaa tataaacaaa agaattgttaa atagtttttt   120
ttaaaaaata gcttggtgct tgcaanaaag tccatataat cttattcccc cccaaatata   180
atttttatact ttgcactaaa ccaaaatagc ttatggaaaa ttagtattaa atagctaaac   240
acagaaaacc tacagctata aataacataa aatacagttt aactttaatg ngatgcttaa   300
acaaagcaaa ctatgatgca atatgaatca acttcattaa ttggacaagt ccagnggagg   360
cacaaattag ataagcacta a                                     381

```

<210> 26

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 26

```

ggaaaagggg ctggcctctc tgaagagtga gatgagggaa gtggaaggag agctggaaaag   60

```

```

gaaggagctg gagtttgaca cgaatatgga tgcagtacag atggtgatta cagaagccca 120
gaaggttgat accagaagcc aagaacgctg gggttacaat ccaagacaca ctcaacacat 180
tagacgggct cctgcattct gatggacca ccttttcang tggtaagatt gaagangggg 240
cctgggctta cctgggaagc aaaaactttt cccganccaa ggaacccagg attcaaccan 300
gcnacttgcn ggccaaggaa ggcanactn ggaanaaaag gccccttaag caaaagggnc 360
accttcattt gctnggaaan cagcctttan ttggaatctt g 401

```

```

<210> 27
<211> 383
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(383)
<223> n = A,T,C or G

```

```

<400> 27
aattgcaact ggacttttat tgggcagtta cnacaacnaa tgttttcana aaaatatttg 60
gaaaaaatat accacttcat agctaagtct tacagagaan aggatttgct aataaaactt 120
aagttttgaa aattaagatg cnggtanagc ttctgaacta atgcccacag ctccaaggaa 180
nacatgtcct atttagttat tcaaatacca gttaggggca ttgtgattaa gcaaacaata 240
tatttggtan aactttgntt ttaaattact gntncttgac attacttata aaggagnctc 300
taactttcga tttctaaaac tatgtaatac aaaagtatan ntttccccat tttgataaaa 360
gggccnanga tactgantag gaa 383

```

```

<210> 28
<211> 401
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

```

```

<400> 28
ggtcgcgttt cccctggctc acagtctgcc attatttgca tttttaaatg aagaaaagtt 60
taacgtggat ggatggacag tttacaatcc agtggaagaa tacaggaggc agggcttgcc 120
caatcaccat tggagaataa cttttattaa taagtgtctat gagctctgcg acacttacc 180
tgctcttttg gtggttccgt atcgtgcctc anatgatgac ctccggagag ttgcaacttt 240
taggtcccga aatcgaattc cagtgtgtgc atggattcat ccagaaaata agacgggtcat 300
tgtgcgttgc agtcagcctc ttgtcggtat gagtgggaaa cgaaataaag atgatgagaa 360
atatctcgat gttatcaggg agactaataa acaaatttct a 401

```

```

<210> 29
<211> 401
<212> DNA
<213> Homo sapien

```

```

<400> 29
atatgagttt gccatctcca tggatgccat ttcaatgcct tcagggtaat cattctctcc 60
ccaaagactg cccacggggt catcactcct gtgacgaaat gagggctgga ttgaagatgt 120
tctgctgagc acccccctgg tcatcttttg ggtctcagaa gagccataat catgaccatt 180
ctcagcatct gaataatcag gttctctcca agtgcttgge aagttctgat tgtcctcagc 240

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actgggtag tctggctccc caaaaaaggg tggagagtta ggttgaatgt cagcgctgg 300
 ataactcaggc tttcccagag agtctgcgta tggattgatt ctaaaacttg tatgttccag 360
 attctttctg gatcctggat ggttcaaatt ggctctgggt c 401

<210> 30
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 30
 cctgaactat ttattaaaa catgaccact cttggctatt gaagatgctg cctgtatttg 60
 agagactgcc atacataata tatgacttcc tagggatctg aaatccataa actaagagaa 120
 actgtgtata gcttacctga acaggaatcc ttactgatat ttatagaaca gttgatttcc 180
 cccatcccca gtttatggat atgctgcttt aaacttggaa gggggagaca ggaagtttta 240
 attgttctga ctaaaacttag gagttgagct aggagtgcgt tcatggtttc ttcactaaca 300
 gaggaattat gctttgcact acgtccctcc aagtgaagac agactgtttt agacagactt 360
 tttaaaatgg tgccctacca ttgacacatg cagaaattgg t 401

<210> 31
 <211> 297
 <212> DNA
 <213> Homo sapien

<400> 31
 acctccatta atgccagggtg ttcctcctct gatgccagga atgccaccag ttatgccagg 60
 catgccacct ggattgcac atcagagaaa atacaccag tcattttgcg gtgaaaacat 120
 aatgatgcca atgggtggaa tgatgccacc tggaccagga ataccacctc tgatgcctgg 180
 aatgccacca ggtatgccc cacctgttcc acgtcctgga attcctcaa tgactcaagc 240
 acaggctgtt tcagcgccag gtattcttaa tagaccacct gcaccaacag caactgt 297

<210> 32
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 32
 caaacctgga gccaaaaagg acacaaagga ctctcgaccc aaactgcccc agaccctctc 60
 cagaggttgg ggtgaccaac tcatctggac tcagacatat gaagaagctc tatataaatc 120
 caagacaagc aacaaaccct tgatgattat tcactacttg ggtgagtgcc cacacagtca 180
 agctttaaag aaagtgtttg ctgaaaataa agaaatccag aaattggcag agcagtttgt 240
 cctcctcaat ctggtttatg aaacaactga caaacacctt tctcctgatg gccagtatgt 300
 cccaggatt atgtttgttg acccatctct gacagttaga gcccgatatc actggaagat 360
 attcaaaccg tctctatgct tacgaacctg cagatacagc t 401

<210> 33
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 33
 agcagagga caggaatcat tcggccactg ttcagacggg agccacaccc ttctccaatc 60
 caagcctggc cccagaagat cacaagagc caaagaaact ggcagggtgc cagcgctcc 120
 aggccagtga gttggtgtc acttactttt tctgtgggga agaaattcca taccggagga 180
 tgctgaaggc tcagagcttg accctgggac actttaaaga gcagctcagc aaaaaggga 240
 attatagga ttacttcaaa aaagcaagcg atgagtttgc ctgtggagcg gtgtttgagg 300

```

agatctggga ggatgagacg gtgctcccg tgtatgaagg ccggattctg ggcaaagtgg 360
agcggatcga ttgagccctg gggctcggct ttggtgaact g 401

```

```

<210> 34
<211> 401
<212> DNA
<213> Homo sapien

```

```

<400> 34
aacaatggct atgaaggcat tgcgttgca atcgacccca atgtgccaga agatgaaaca 60
ctcattcaac aaataaagga catggtgacc caggcatctc tgtatctgtt tgaagctaca 120
ggaaagcgat tttatttcaa aaatgttgcc attttgattc ctgaaacatg gaagacaaag 180
gctgactatg tgagacccaa acttgagacc tacaaaaatg ctgatgttct ggttgcttga 240
gtctactcct ccaggtaatg atgaacccta cactgagcag atggggcaac tgtggagaga 300
aggggtgaaa ggatcccacc tcaactcctga tttcattgca ggaaaaaagt tagcttgaat 360
atggaccaca aggtaagggc atttgtccat gaatggggct c 401

```

```

<210> 35
<211> 401
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(401)
<223> n = A,T,C or G

```

```

<400> 35
catttccttc tactagactg cccccttgat ccactggcag aaatgatggc accaccttgt 60
cttcagggtg tgctccttca ttattccaag gatgcagcat ctctatggtg ccagggtatgg 120
gggtaaagcc tttggcgccc tttccgcaat ggcacatcag cagtaaaagt ggtaccaata 180
gcangaacag aaagggcaaa atcatgancg caattgctgc ggggcccaag cccacatagg 240
aatcatgctg ngcttcctg canccgctgc catgcaagac actnacaaac tngngantgta 300
aggacctgct tttcaggaca actaaaaccc tgattgnctg aaatcaggaa ctgaatttca 360
cttctcccaa gctttttctc actttggtgc aacancacac t 401

```

```

<210> 36
<211> 401
<212> DNA
<213> Homo sapien

```

```

<400> 36
cctgctagaa tcaactgcgc tgtgctttcg tggaaatgac agttccttgt tttttttgtt 60
tctgtttttg ttttacatta gtcattggac cacagccatt caggaactac cccctgcccc 120
acaaaagaaat gaacagtgtg agggagaccc agcagcacct ttccctccaca caccttcatt 180
ttgaagttcg ggtttttgtg ttaagttaat ctgtacattc tgtttgccat tgttacttgt 240
actatacatc tgtatatagt gtacggcaaa agagtattaa tccactatct ctagtgtttg 300
actttaaatc agtacagtac ctgtacctgc acggtcaccc gctccgtgtg tcgccctata 360
ttgagggctc aagctttccc ttgttttttg aaaggggttt a 401

```

```

<210> 37
<211> 401
<212> DNA
<213> Homo sapien

```

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 37
 cnnctntgna atggantnnt tgnctaaaaan ganttgatga tgatgaanat ccctangang 60
 antaagcatg gancntgac ntttntctnng cactccttta cgacacggaa acangnatca 120
 ncatgatggt accaganacc ttatcaccna cgcgcacnga nctgactnat tccaaagagt 180
 tnggggttacg gncatccggt cattgctcgt gccattgct gcagggctga tntactggt 240
 gcttattatg ntggccctga ggatgctcca caatgaatat aagcatgctg catgatcagc 300
 ggcaacanat gctctgccgt ttgcactaca tctttcacgg acacnatntc gaanacgggc 360
 acnttgcana gttagacttg gaatgcatgg ngccggnan n 401

<210> 38
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 38
 aattggctca ctctctcaag gcaagcactg tctcaaggca gtctcaaggc agagatgaca 60
 cagcaaaaaa cagaggggga gaaaaaagtc tattattggc ttgtgattta caaaagccaa 120
 agtccttttag ataaaaggcc aggagtcgta ccaacataga taccaaatcc aggagaacac 180
 agaccagcga taagagggac gcttcccat gaccagacc agcctaaagc ccctgtgggg 240
 gcagccagtg gggagctgtc agaccttgga catggtggtc tttgagaatg ggtctgccct 300
 tctctccctg accagttggg atagacacct gactggaatc cttgacactg gcaggtgttt 360
 ctatgaacag agaggactgt gcctgtcttc ctgaatccca a 401

<210> 39
 <211> 401
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 39
 tctgggtangg agcaattcta ttatttggca ttgcatggct ggggtgaatt aaaacagggg 60
 gtgagaacag gtgagtctag aagtccaact ctgaaaagga ccactgtaca tttgaacaca 120
 cggtgtgttt aaagatgctg ctaatgtcag tctactgggtg cactaaagga tctcttattt 180
 tatgtaaaac gttgggaatg acaagatana actgatactc tggtaagtta ccctctgaag 240
 ctacttcttg tgaaatacta atgacagcat catcctgcca agcgaaagag gcaggcataa 300
 gcaaggacaa attaaaaggg ggtaagagcc ttatcatgat gaggagtctt gttttgacat 360
 cttgggaaaa gctgtccata gtgtgaagtc gtcaatttct c 401

<210> 40
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 40
 tctggtcacc caactcttgt ggaagagggg aattgagatc gagtactgaa tatctggcag 60
 agaggctgga atccttcagc cccagagccc agggaccact ccagtagatg cagagagggg 120

```

cctgcccagg ggtcagggca gtgggtatca ctggtgacat caagaatata agggctgggg      180
aggcatcttt gtttcctggt gccctcctca aagttgctga cactttgggg acgggaaggg      240
gtagaagtag ggctgctcct tttggagctg gaggggaatag acctggagac agagttgagg      300
cagtcgggct gtccaggttc taagcatcac agcttctgca ctgggctctg aggagattct      360
cagccagagg atcccagcct cctcctccct caaatgtcaa g                                401

```

<210> 41

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 41

```

ctggactaaa aatgtccact atggggtgca ctctacagtt tttgaaatgc taggaggcag      60
aaggggcaga gagtaaaaaa catgacctgg tagaaggaaag agaggcaaag gaaactaggt      120
ggggaggatc aattagagag gaggcacctg ggatccacct tcttccttan gtcccctcct      180
ccatcagcaa aggagcactt ctctaatacat gccctcccga agactggctg ggagaagggt      240
taaaaacaaa aaatccagga gtaagagcct taggtcagtt tgaaattgga gacaaactgt      300
ctggcaaagg gtgcganagg gagcttgtgc tcangagtc agcccgtcca gcctcggggg      360
gtangtttct gaagtgtgcc attggggcct caccttctct g                                401

```

<210> 42

<211> 310

<212> DNA

<213> Homo sapien

<400> 42

```

ggttcgacaa atccccaaaa atggcaaatt aagccctgtg acaaaataag ttattggatc      60
atacagaaat agcccaaatac tggaattttt gaattaaaat tgtaatcctg taaaacaagt      120
tttgggggtga atggattttt ttaataccaa taatatTTTT aattcccacc acagatggat      180
ttgctgaata tgctaattgct gtgaatgaga aaacaatttt ggggtaggta taccacaag      240
taatctgatg acaaaataaa ccacagactg atgtcaaatg gacaaaaaac tgaaaatatg      300
ctgtgagaaa                                310

```

<210> 43

<211> 401

<212> DNA

<213> Homo sapien

<400> 43

```

aggtcactta cacttgtgac cagtgtgggg cagagacctt ccagccgatc cagtctccca      60
ctttcatgcc tctgatcatg tgcccaagcc aggagtgcc aaccaaccgc tcaggagggc      120
ggctgtatct gcagacacgg ggctccagat tcatacaaat ccaggagatg aagatgcaag      180
aacatagtga tcagggtgcct gtgggaaata tcctcgttag tatcacgggt ctggtagaag      240
gagagaacac aaggattgcc cagcctggag accacgtcag cgtcactggt attttcttgc      300
caatcctgcg cactgggttc cgacaggtgg tacagggttt actctcagaa acctacctgg      360
aagcccatcg gattgtgaag atgaacaaga gtgaggatga t                                401

```

<210> 44

<211> 401

<212> DNA

<213> Homo sapien

<400> 44

atccctgtaa	gtctattaaa	tgtaaataat	acatacttta	caacttctct	tagtcggccc	60
ttggcagatt	aaatctttgc	aaaattccat	atgtgctatt	gaaaaatgaa	ataaaacctc	120
agatgtctga	attcttattt	caaatacagt	tatataatta	ttttaaatta	caatatacaa	180
tttctgttaa	atacaactgt	taagggattc	tgagaacaat	tataagatta	taataatata	240
tacaaactaa	cttctgaaat	gacatgggtt	gtttccttcc	caccctccta	ccctctcaaa	300
gagtttttgc	atttgctggt	cctggttgca	aaaggcaaaa	gaaaatctaa	aaatagtctg	360
tgtgtgtcca	cgacatgctc	gctcctttga	gaatctcaaa	c		401

<210> 45

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 45

gtgcctgctg	cctggcagcc	tggccctgcc	gctgcctcag	gaggcgggag	gcatgagtga	60
gctacagtgg	gaacaggctc	aggactatct	caagagattt	tatctctatg	actcagaaac	120
aaaaaatgcc	aacagtttag	aagccaaact	caaggagatg	caaaaaattc	tttggcctac	180
ctatactgga	atggtaaaact	cccgcgtcat	anaaataatg	caanaagccc	agatgtggag	240
tgccagatgt	tgcagaatac	tcactatttc	caaataagccc	aaaatggact	tccaaagtgg	300
tcacctacag	gatcgtatca	tatactcgag	acttaccgca	tattacagtg	gacgcattag	360
tgtcaaaggc	tttaaacatg	tggggcaaag	agatccccct	g		401

<210> 46

<211> 401

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(401)

<223> n = A,T,C or G

<400> 46

gtcagaattg	tctttctgaa	aggaagcact	cggaatcctt	ccgaactttc	caagtccatc	60
catgattcan	agatactgcc	ttctctctct	ctgggatttt	atgtgtttct	gatagtgaat	120
tgttgatgta	tttgctactt	tgcttctttt	ctctttcaag	acttgatcat	tttatatgct	180
gnttggagaa	aaaaagaact	tttggtagca	aggaggtttc	aagaaatgat	tttggatttt	240
ctgctgcgga	atttctcggc	acctacctgt	agtatggggc	acttggtttg	gttgcagagt	300
aagaaggtgg	aagaatgagc	tgtacttggg	taagcagttg	aaaccttttt	tgagcaggat	360
ctgtaaaagc	ataattgaat	ttgtttcacc	cccgtggatt	c		401

<210> 47

<211> 401

<212> DNA

<213> Homo sapien

<400> 47


```

ggctctgcagc aatgcacttc aaccatacat actgcttcca ctagctaata ccaaatgcag      60
gttctcagat ccagacaaat ggaggaaaag aacatttatg cttccgtttc agaaagccaa      120
gtcgtagttt tggcccttcc tttctctaaa gtttattccc aaaaacaggt agcattcctg      180
attgggcaga gaagaggata ttttcagccc acatctgctg caggatgtc attttctccc      240
atcttcactg tgactagtaa agatctcacc acttctcttt ggaatttcca actttgcttg      300
tgattgaatg tcacttcgtg aatttgtatt atgtcagatc acttggcatt gctcttccat      360
atgcatcaag ttgccaggca ctaaacccaa tgttcatgaa c                                401

```

```

<210> 48
<211> 430
<212> DNA
<213> Homo sapien

```

```

<400> 48
acataacttg taaacttttt ctgcttgggg gctgtaacag acagaagagt aaagactaca      60
aggattttct gaagatgctt caatgaaaat catcatttcc tctttagtca tcccaagtct      120
tggtttgaaa aacttgggca tggacttata cagaccttga accaccactg acttatcatt      180
gggtggcaga ccttgaaacc aagctctctg tgttacttct gaaagtgcac caattctgat      240
ttggctaaga acagaagaca aatactggga tcgtgattct gtgttatact ctagccacag      300
catagcagct tctcgaacgg tttcttcctt ttctacattt aaattgtcac tactgagaat      360
atctatcagt aggtcatgtg acagacctgc cccggggccg gcccgctcga tgettggcga      420
atatcatggt                                430

```

```

<210> 49
<211> 57
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(57)
<223> n = A,T,C or G

```

```

<400> 49
gggtattaaca atatcangca ctcatcttcc cctcttatg aaanggatna attttta      57

```

```

<210> 50
<211> 327
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(327)
<223> n = A,T,C or G

```

```

<400> 50
gatggnggtn tccacaagan tnaangtnen tattaantan nncttgtaga nccacttnna      60
ttaattgnnn tatgnntgnc cttctgggtg ntgtngaagc ttcatatnnt ntttggacat      120
cattacacgt cttagctctt tnaagnacaa ctttaatgct atatgaattt tgccattttt      180
gctaacactg gtatgctccn ngcatccacc atnccacntg gaattattta ttncttccat      240
attaatnttt tgtttaccaa atctnacttg acccgaacga aactttctgn gtattttang      300
gccccnccat tcttactttt caagcct                                327

```

```

<210> 51

```

<211> 236
 <212> DNA
 <213> Homo sapien

<400> 51
 cgtctcgaag aagcgctgca ggccgatgat ggactgcacg tctgccttgt cctcaggttaa 60
 cttgttgaat tgcttgaaca tgcggcccac atcctgggca aactcctgtg gggagctgta 120
 gggaggtgac aacttctcct ggaggcgggc acggatcagg gtcagatcca gggtgccacc 180
 gggctggtcc agggagaagg tggagtcgta gccagacctg cccgggcggc cgctcg 236

<210> 52
 <211> 291
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(291)
 <223> n = A,T,C or G

<400> 52
 ctcacatcct ggggtccggct gtagagctgc accatgggtgc tgagcgcccc ctccagctcc 60
 ttgtagatgt aaaggacggc gaaggagctg tagtctgtgt ccacgatgcg cacgtccagg 120
 tagcccaagg ccgggactct gaagttgtcc ctccggagccc accttcangt actcgggcat 180
 ccacctgggt acagccnttc gncctcggna actccatntg gactttacag gccgccctcc 240
 tctgtggggc tgatggnctt tgcaggacat nggaacacgg gagctcnctt t 291

<210> 53
 <211> 95
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(95)
 <223> n = A,T,C or G

<400> 53
 gtctgtgcag tttctgacac ttgttgttga acatggntaa atacaatggg tatcgctgan 60
 cactaagttg tanaanttaa caaatgtgct gnttg 95

<210> 54
 <211> 66
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(66)
 <223> n = A,T,C or G

<400> 54
 cctnaatnat ntnaatggta tcaatnnccc tgaangangg gancggngga agccggnttt 60
 gtccgg 66

<210> 55
 <211> 265
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(265)
 <223> n = A,T,C or G

<400> 55
 atctttcttc tcagtgcctt ggccntgttg agtctatctg gtaacactgg agctgactcc 60
 ctgggaagag agggccaaatg ttacaatgaa cttaatggat gcaccaagat atatgaccct 120
 gtctgtggga ctgatggaaa tacttatccc aatgaatgcc gtgttatgtt ttgaaaatc 180
 ggaaacgcca gaattctatc ctcattcaca aactctgggc ttactgaaaa ccagggtttt 240
 naaaatccca ttenggtcnc cggcg 265

<210> 56
 <211> 420
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(420)
 <223> n = A,T,C or G

<400> 56
 gagcggccgc ccgggcaggt cctcgcggtg acctgatggg atttcaaac cttggttctc 60
 agcaaggccc agatttttga atgangatag aagtctggcg ttcccgattt tcaaaacata 120
 acacgcattc attgggataa gtatttccat cagtcccaca gacngggica tatatcttgg 180
 gtgcatccat taagttcntt tgtaaacatt tgggcctctc ttccccangg gaattcagct 240
 cccagttgtt taccaanatt naactccacc ggggccaaaag gcncttgaaa aaaaaaanaa 300
 ttccttggtt accttccttg ggcttnaagt tctggcgctc aaaagttcaa ttgaaaact 360
 gcaccgcact taccacgtct cttcnagaan cctggggaca cctcgyccgc gaccacgcta 420

<210> 57
 <211> 170
 <212> DNA
 <213> Homo sapien

<400> 57
 gaagcggagt tgcagcgctt ggtggccgcc gagcagcaga aggcgcagtt tactgcacag 60
 gtgcatcact tcatggagt atgttgggat aaatgtgtgg agaagccagg gaatcgcccta 120
 gactctcgca ctgaaaattg tctctccaga cctcggccgc gaccacgcta 170

<210> 58
 <211> 193
 <212> DNA
 <213> Homo sapien

<400> 58
 attttcagtg cgagagtcta ggcgattccc tggcttctcc acacatttat cccaacataa 60
 ctccatgaag tgatgcacct gtgcagtaaa ctgcgccttc tgctgctcgg cggccaccag 120
 gcgctgcaac tccgcttcat cggtctcgcc cagctccgcc attgttcgcc acctgcccgg 180

gcggccgctc gaa

193

<210> 59
 <211> 229
 <212> DNA
 <213> Homo sapien

<400> 59

cgcaactctc	gagcatttat	atacaatagc	aatcatcca	gtgtgttgta	cagtctataa	60
tactccaaca	gtctcccatc	tgtattcaat	ggcgccaccc	aatacagtc	tttgtttga	120
tgctggggag	agtaatccct	acccaagca	ccatatagat	aagaaaacc	tctccagttg	180
agctgaacca	cagacggttt	gctgatacct	gcccgggcg	ccgctcgaa		229

<210> 60
 <211> 340
 <212> DNA
 <213> Homo sapien

<400> 60

tcgagcggcc	gcccgggcag	gtcctctaaa	gatcaaaaca	cccctgtcgt	ccaccctcct	60
cccastccag	ggaagctgtg	gtcatgggtg	tgtggtgaac	atcagcaaac	cgtctgtggt	120
tcagctcaac	tggagagggg	tttcttatct	atatggtgct	tggggtaggg	attactctcc	180
ccagcatcca	acaaaaggac	tgtattgggt	ggcgccattg	aatacagatg	ggaaactgtt	240
ggagatttat	aaactggtac	aacacactgg	atgatttgct	attgtatata	aatgctcgag	300
aattgcggat	cacctatgga	cctcggccgc	gaccacgctg			340

<210> 61
 <211> 179
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(179)
 <223> n = A,T,C or G

<400> 61

tttttgtgac	ggacgnttgg	agtacatgtc	ccaggatcac	atccagcagc	tagagtggct	60
gggacaagct	ggcgngggcc	aagcactgtt	gaaacnatag	gggtctgggn	gnactcgggt	120
tnaagtgggt	ggtccgantn	tnataacct	gtcnngaacc	nancatctcg	gttgncang	179

<210> 62
 <211> 78
 <212> DNA
 <213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(78)
 <223> n = A,T,C or G

<400> 62

agggcggttcg	taacgggaat	gccgaagcgt	gggaaaaagg	gagcggtggc	nggaagacgg	60
ggatgagctt	angacaga					78

<210> 63
 <211> 410
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(410)
 <223> n = A,T,C or G

<400> 63
 cccagttact tggggaggct gaggcagggg gaatcctttg aaccggngg gtgggaggtt 60
 gcagtgagcc cgagatagca ccattgcact tccancatgg ggtggacaga gtgagactct 120
 atctcaaaaa aaaagaaaag aaaaggaaaag agattagatt aagattaagt acctacttcc 180
 tntcccatTT caagtcttga aaatagagga tcagaaatgt tyaggaattc tttaggatag 240
 aaagggagat gggattttac ttatggggaa agaccgcaa taaagactgn aacttaacca 300
 cattcccaa gtgnaagggtg ttacccaaga agtaggaacc cttttggctn ttaccttacc 360
 ttccngaaaa aaacttattn cttaaaatgg aaacccttaa agcccgggca 410

<210> 64
 <211> 199
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(199)
 <223> n = A,T,C or G

<400> 64
 cttgttctca aaaaggtcaa agggagcccg acgaggaata aatagcaatg cccrtaattc 60
 caactgacct tctacagaaa agtgcttgac tgccaagtgg tcttcccagt cattagttag 120
 gctctttag aattctccat actcctcttg ggngangnca tnagggttn nggccccaat 180
 aggntggggcc tngttaagt 199

<210> 65
 <211> 125
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(125)
 <223> n = A,T,C or G

<400> 65
 agcggtagag ttctgtcctg gcacatcat tcatgttagt atggtaata ggtgccatga 60
 aactcagtag cttgctaagg acatgaaacc gaagtttctt gcctttgctg gcctngtngn 120
 gggtg 125

<210> 66
 <211> 204
 <212> DNA
 <213> Homo sapien

<400> 66
 attcagaatt ctggcatcgg tatttctata aagtccatca gttagagcag gagcaggccc 60
 ggaggggacgc cctgaagcag cgggcggaac agagcatctc tgaagagccc ggctgggagg 120
 aggaggaaga ggagctcatg ggcatttcac ccatatctcc aaaagaggca aagggttcctg 180
 tggacctcgg ccgcgaccac gcta 204

<210> 67
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(383)
 <223> n = A,T,C or G

<400> 67
 tcagggcctc caggcagcca gttttgcagg anattcagca cctagngtct tcctgcctna 60
 cgctcccaag aacctgctcc tgcaggggga acatcagaac tcgtccctga tgtcaaaatg 120
 gggctggtct tnaggcttga agtccagggt agggctgcca tcctcattga gaattctccg 180
 ggcagtgtan ccgacgatgg ggtatttggc tttgtacact ttgggtgaaaa cctnatccag 240
 ggcctccagt tccttggccg tganaccgt antgtcatgg gtgaggtctg caggatccaa 300
 ggacatcttg gctaccctc tagtggagtc cttcccgcgc aaggcattgt aaggggctcc 360
 tcgtccataa aactcctttt cgg 383

<210> 68
 <211> 99
 <212> DNA
 <213> Homo sapien

<400> 68
 tcacatctcc tttttttttt aactttttca aatttttgtg ttaaatagaa ggctaaaggg 60
 ttagatttaa gtttctgcta cattgacctt atttaccta 99

<210> 69
 <211> 37
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(37)
 <223> n = A,T,C or G

<400> 69
 gagaaggacn tacggncctg ntantanang aatctcc 37

<210> 70
 <211> 222
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(222)

<223> n = A,T,C or G

<400> 70

gtgggtcatt	tttgctgtca	ccagcaacgt	tgccacgacg	aacatccttg	acagacacat	60
tcttgacatt	gaagcccaca	ttgtccccag	gaagagcttc	actcaaagct	tcatggcgca	120
tttcgacaga	ttttacttcc	gttgtaacgt	tgactggagc	aaaggtgacc	accataccgg	180
gtttgagaac	acccantcac	ctgccccggg	cgcccgctcg	aa		222

<210> 71

<211> 428

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(428)

<223> n = A,T,C or G

<400> 71

caggagtatt	ttgtagaaaa	gccagaagag	cattagtaga	tgtatggaaa	tatacggtag	60
ggcacacgct	gacagtactt	ttcccaagcc	acgccgtatt	tcttcttaca	gtggtactcg	120
tcacgagctt	ctcgttgga	aagcaacatg	gtgaaataaa	ttatgtagaa	ataaggcaga	180
atgtgggttaa	aaccacatgg	gagggaccac	gccaaggcca	tgatgagatc	acccaagtaa	240
ttgggggtggc	gaacaaaagcc	ccaccatcca	gaaactagaa	naatTTTTcc	cgttgaaata	300
tgaatggntt	ttaaatgtgc	aagctttgga	tactgggaa	ttttcccgaa	tgcttttttc	360
tganaattgc	accttnggaa	gantccttac	cccaagnttc	agaccattat	ttnaaaagcn	420
ttggaact						428

<210> 72

<211> 264

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(264)

<223> n = A,T,C or G

<400> 72

gaataaagag	cttactggaa	tccagcaggg	ttttctgccc	aaggatttgc	aagctgaagc	60
tctctgcaaa	cttgatagga	gagtaaaaag	ccacaataga	gcagtttatg	aagatcttgg	120
aggagattga	cacacttgat	cctgccagaa	aatttcaaag	acagtagatt	gaaaaggaaa	180
ggctttggta	aaaaaagggt	caggcattcc	tagccgantg	tgacacagtg	gagcanaaca	240
tctgcangag	actgancggc	tgca				264

<210> 73

<211> 442

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(442)

<223> n = A,T,C or G

<400> 73

```

ggcgaatccg gcgggtatca gagccatcag aaccgccacc atgacgggtgg gcaagagcag      60
caagatgctg cagcatattg attacaggat gaggtgcatc ctgcaggacg gccggatctt      120
cattggcacc ttcaaggctt ttgacaagca catgaatttg atcctctgtg actgtgatga      180
gttcagaaaag atcaagccaa agaacttcaa acaagcagaa agggaagaga agcagatcct      240
cggctctgng ctgctgccaa gggagaatct ggtctcaatg acngtagaag gaccttcttc      300
caaagatact ggnattgctc gagtccact tgctggaact tcccggggcc caaggatcgc      360
aaggcttctg gcaaaagaaa tccanacttn ggccgggacc acctaanca attcacacac      420
tggcgccgt actagtggat cc                                         442

```

<210> 74

<211> 337

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(337)

<223> n = A,T,C or G

<400> 74

```

ggtagcagcg tctccagagc ctgatctggg gtcccagata cccaggcagc agcagccctg      60
gaggtaaagg gcaagctccc caatgtgagg ggagacccca ttcctgggtca gccaggcttt      120
cagaggagat agcaggctga gggagccaac gaagaagaga ctgccancag ggggaaggact      180
gtcccgccaa ggacagaact gattcagggg ggtcaatgct cctctagaga agagccacac      240
agaactgggg ggtccaggaa ccatgaanct tggctgtggt ctaaggagcc aggaatcttg      300
acagtgttct gggtcatacc aggattctgg aattgta                                         337

```

<210> 75

<211> 588

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(588)

<223> n = A,T,C or G

<400> 75

```

catgatgagt tctgagctac ggaggaaccc tcatttcctc aaaagtaatt tatttttaca      60
gcttctggtt tcacatgaaa ttgtttgcgc tactgagact gttactacaa actttttaag      120
acatgaaaag gcgtaatgaa aaccatcccg tcccattcc tcctcctctc tgagggactg      180
gagggaaagg gtgcttctga ggaacaactc taattagtac acttgtgttt gtagatttac      240
actttgtatt atgtattaac atggcgtggt tatttttgta tttttctctg gttgggagta      300
tgatatgaag gatcaagatc ctcaactcac acatgtagac aaacattagc tctttactct      360
ttctcaaccc cttttatgat ttaataatt ctcacttaac taattttgta agcctgagat      420
caataagaaa tgttcaggag agangaaaga aaaaaaatat atgttcccca tttatattta      480
gagagagacc cttantcttg cctgcaaaaa gtccaccttt catagtagta ngggccacat      540
attacattca gttgctatag gncagcactg aactgcatta cctgggca                                         588

```

<210> 76

<211> 196

<212> DNA

<213> Homo sapien

<400> 76
gcggtatcac agcctggccc ccatgtacta tcggggggcc caggctgcca tcgtggtcta 60
tgacatcacc aacacagata catttgacg ggccaagaac tgggtgaagg agctacagag 120
gcaggccagc cccaacatcg tcattgcact cgcggtaac aaggcagacc tggacctgcc 180
cgggcgggcg ctcgaa 196

<210> 77
<211> 458
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(458)
<223> n = A,T,C or G

<400> 77
agtagagatg gggtttcact gtgttaacca ggatggtctt gatctcctgg cctcgtgatc 60
tgccgcctc ggccctccaa agtgttgga ttacaggcgt gaaccaccgc acccggccag 120
aaatgttagt ttttccctat tctctctct ttttctatt atatacttgg tcaaccagac 180
agccatccta cccanaatg gtaatgcctc ttcattcctc atatgagggg ataaaagaga 240
aaaaagcttt tggaaaacat ccacttatct aatcatccca aatatgtaat caaaagtata 300
caactcatgt gaagaataca ctggtaaaat gttantatag gccaaggtat cttgaattcc 360
tatatagaaa gctggtaaat gcccttttgg ctggaaccgc catcttcnn taattcnccc 420
aaaatgacca aacacaaagg gnaagangan aagcccc 458

<210> 78
<211> 464
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(464)
<223> n = A,T,C or G

<400> 78
tccgcaaatt tcctgccggc aaggctccag catttgaggg tgatgatgga ttctgtgtgt 60
ttgagagcaa cgccattgcc tactatgtga gcaatgagga gctgcgggga agtactccag 120
aggcagcagc ccagggtggtg cagtgggtga gctttgctga ttccgatata gtgccccag 180
ccagtacctg ggtgttcccc acctggggca tcatgcacca caacaaacag gccactgaga 240
atgcaaagga ggaagtgagg cgaattctgg ggctgctgga tgcttacttg aagacgagga 300
cttttctggt gggcgaacga gtgacattgg ctgacatcac agttgtctgc accctgttgt 360
ggctctataa gcaggntcta gaaccttctt ttcgcangac cttcggccgg accacgctta 420
acccaaattc cacacacttg cnggccgtac taanggaatc ccac 464

<210> 79
<211> 380
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(380)
<223> n = A,T,C or G

```

<400> 79
ctgtatgacc agttttttcca tctccttcac ttctaccttg atcagctcga agtccagttc      60
agtgtgaagaa atggtatcct tctccatgat gtcaattcgg acagttagggt ttaacagttt      120
cttttcatac aactaatta attggacata ttccctcact ttanaaagtt ctttctcaaa      180
cttctganaa aagaacatga actgtgaatt ccaagcggtc cactctgtc cacgggaaaa      240
ggtggtgtct ggcaggggaaa cagaacactg gcagggtccac ggtcatccac ggagccgggtg      300
aaattgggaa aacaactggg acacagaacc tccgctgcct aagctgcggn tgggagcttg      360
gaacccgacc tggaactgga

```

<210> 80

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

```

<400> 80
tcgagcggcc gccggggcag gtctcagag agctgtttgt tncgcttctt caaaaactcc      60
tatttccac ttctgctaaa ggactggatg acatcaattg tgatagcaat atttgtgggt      120
gttctgtcan ncancatcgc actcctgaac aaagtagatg ttggattgga tcagtctctt      180
tccaccaga tgactcctan atggtggatn atttcaaadc catcantcag tacctgcatg      240
cgnggtccgc ctgtgtncct tgtcctgcag gangggcnct actacacttc ttccnagggg      300
canaacatgg tgtgcngcgg ccatgggctg gcaacantga ttcnctgctg caccanatan      360

```

<210> 81

<211> 440

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(440)

<223> n = A,T,C or G

```

<400> 81
acgtggtccg gcgagtctga cctgcagata tgaactcctt gggaaacctt cattctgcct      60
cagacatact gggggcaaag ggcttttaaa gtctggctca gggagccaag attacagaaa      120
nccgttgagt cncatacat ggacactgac aaaggaaactg aagatatcca aacaagccct      180
cctgggtccc ngcctgcata aagatcgagg ncggaacggt accngacgtc tgtggtcagg      240
ggttgtggaa aattggaaaa aaccagtcct gccacattg acagggaagc ctcaacggaa      300
attgaacaga tngtcttacc accagtctcc cctcctggat cntgtctcgg ctcnngggan      360
tcagtgatca gtcctttcag gtggaagaag caaagaagat caacaanaag cngatcctct      420
cacctgntac cagcatatgg

```

<210> 82

<211> 264

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (264)

<223> n = A,T,C or G

<400> 82

agcgtggtcg	cggccgangt	cctgacattc	ctgccttctt	atattaatta	tacnaataaa	60
acaaaatagt	gttgaagtgt	tggagcggcg	aaaatttttg	gggggtggta	tggacagaga	120
atgggcgatn	ttctcanggc	tgcttcaagt	gggattgggg	cngcgtggga	tcatncagtg	180
gganagattn	cnctgaccgg	antctnttgg	tanggatnat	cttgtgggga	tgtgcaagag	240
ncattcgtct	cctgaatgan	tggt				264

<210> 83

<211> 410

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (410)

<223> n = A,T,C or G

<400> 83

ancgtggtcg	cggccgangt	ccacagtgtg	gggagagcca	gccattgtgg	gggcagctcc	60
acaggtaaga	ctcgtgtcct	gagcagcgca	catcatccag	gacaatgggt	cctgagccct	120
gaccaaaccg	ggcatttcct	ggggctgaca	tggcccagcc	acagcccant	tgctgcaga	180
cgaaattggc	atcattgggtg	tcccagtant	catcacacac	ggtgccccag	gaacctccgg	240
tatangaact	ccactcggcc	tcnanacctg	tcgcctccat	tcncagcct	cagggggcaa	300
actgggattc	agatccttct	gtgggtacag	gtggtgatat	cctgacaggc	caactttctg	360
gcctgagtgt	tgactgangc	tgggcagacc	tgcccgggcy	gccgctcgaa		410

<210> 84

<211> 320

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (320)

<223> n = A,T,C or G

<400> 84

tcgaacggcc	gcccgggcag	gtctgcccc	gggtgatcca	tttgccgccg	atctctatca	60
naaggagctg	gctaccctgc	nncgacgaan	tcctgaanat	aatctcacc	ncccagatct	120
ctctgtcgca	atggagatgt	cgatcatcgg	ggncctgatc	acagggcatt	ggactcagag	180
anangtnanc	acagtgtnga	agcgattgan	nnagttcagt	tgctgggtctt	acccgatntt	240
ggaaggaagg	aaaacgtggt	angacgtatc	tcgatgnant	tgaccaaanc	tgaangctnc	300
agggggcatc	gcaaaganan					320

<210> 85

<211> 218

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (218)

<223> n = A,T,C or G

<400> 85

tcgagcggcc	gcccgggcag	gtctgctgcc	cgtgctggtg	ccattgcccc	atgtgaagtc	60
actgtgccag	cccagaacac	tggctctcggg	cccagagaaga	ctcctttctc	caggctntan	120
gtatcaccac	taaaatctcc	aggggcacca	tnganatcct	gggtgtccgc	aatggtgcca	180
atgtctgtcc	gcnnattggc	taccaactg	ttgcatca			218

<210> 86

<211> 283

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(283)

<223> n = A,T,C or G

<400> 86

tcgacttctt	gtgaaggttt	tgganaaata	tgtatcagtt	cgttttattt	gggtattcaa	60
taatatcctt	ggtgataatg	ctgactccat	ggcttctgac	cccaaaaatt	gaccctgctg	120
ccactgggtg	tagccctgag	attgattttt	gtagccacga	ttgtttcctc	gtcctctgaa	180
gtnctgggtg	tanttccttc	tgtngggcat	tcccctctgt	tgtanttccc	tctgtttgan	240
taactaccac	ggccaggaaa	aacaggggca	cgaaggatatg	gat		283

<210> 87

<211> 179

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(179)

<223> n = A,T,C or G

<400> 87

agcgtgggtc	cggccgatgt	ctttctgtgt	aagtgcataa	cactccacat	acttgacatc	60
cttcangtca	cgggccagct	nttcagcant	ctctggagtg	ataggctact	gtntgttctn	120
ggcaagtgtc	tcaanaatac	aggggtcntc	tctgagatga	ntttcagtc	cgaaccctc	179

<210> 88

<211> 512

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(512)

<223> n = A,T,C or G

<400> 88

tcgagcggcc	gcccgggcag	gtcctanacan	agaatcacca	aatttatgga	gagttaacag	60
gggtttaaca	ggaangaagt	gccttttagta	agttctcaag	ccagangctg	gaggcagcag	120
ctaaatcaga	ggacaggatc	ctcagtgaaa	gtgagccatt	cggggtggca	tgctactcca	180
ggaataagca	caacttanaa	acaaatgatt	tcgtangata	gcacagtgc	attggtgcac	240

ttgtgaacct	gaggccactg	tgtcaaactg	tgcactgggt	gtgaataggg	aganccaaaa	300
attatgtcct	actgggtaat	gagctttcaa	tgggctcgat	cctctcacnc	tgaaagctct	360
gtagagcagc	tcagaaccac	aaccactccc	aacattgacc	cttctggggg	tactgtctgt	420
ggcaccacaca	ggaaggagct	ggagatcccc	attaggactg	tccaccacaca	cttgaagcca	480
caaaactgca	cctcggccgc	gaccaccgct	ta			512

<210> 89
 <211> 358
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (358)
 <223> n = A,T,C or G

<400> 89						
tcgagcgggc	cgcccgggca	ggtctgccag	tccccatccc	agacattctt	tgcattctaag	60
ctgangtctg	aactgagtgg	ggtgggctgg	tgtttccatc	ctcacaaactc	cagtgaagccg	120
ggtgtggccg	tggcctgcgt	ctctctggcg	gttagtgatg	ttggcatcat	ccaccttttt	180
caaaacaaaa	gcactggact	gaagaanaat	ccnccctgt	ntccaccacag	tccatggttt	240
ttaataaaaag	ggttatnnaa	gttgancaag	ncatcaccac	acacaancct	aagaacnttt	300
ttcatcnntc	cccaaaacaa	accncaccc	tgggaactcc	gggcgcgaac	cacgccta	358

<210> 90
 <211> 250
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (250)
 <223> n = A,T,C or G

<400> 90						
cgagcggccg	cccgggcagg	tctggatggg	gagacggact	ggaactgcgg	cttcccgtgg	60
cctgcacgca	caaggctccc	cacggccgcc	gaccttcttc	agattcgatc	gtatgtgtac	120
gcacnaagag	ccaaatattg	acattcacia	cttcgtggga	atnttacccc	anaagactgc	180
gacccccga	tcaggcgana	gcctgagcat	agaagaacac	cgctgtgggc	ttggcactgt	240
gggncccatc						250

<210> 91
 <211> 133
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (133)
 <223> n = A,T,C or G

<400> 91						
tcgagcggcc	gnccgggcag	gtcccgggtg	gttgtttgcc	gaaatgggca	agttcntnaa	60
ncctgggaag	gtgggtgcntg	tnctggctgg	acgctactcc	ggacgcnaag	ctgtcntcgt	120
gangancatt	gat					133

<210> 92
 <211> 232
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(232)
 <223> n = A,T,C or G

<400> 92
 agcgtggctg cgcccgangt ctgtcacttt gcggggtag cggtcattc cagccaccag 60
 agcatggctg tagggcgat ctgaggtgcc atcatcaatg ttcttcacga tgacaagctt 120
 tgcgtccgga gttaggtcca gccaggacaa gcaccacctt cccacgtntt cangaactng 180
 cccatttcgg cataaccacc cgggacctgc ccgggcggnc gctcgaag cc 232

<210> 93
 <211> 480
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(480)
 <223> n = A,T,C or G

<400> 93
 agcgtgggtc gcggccgang tctgtangct caccggccag agaagaccac tgtgagcatt 60
 ttgccgtata tcttgccttg ccatttgttc acttttttaa ctaaaatagg aacatccgac 120
 acacaccgtt tgcacgtct tctcccttga tattttaagc attttcccat gtcgtgagtt 180
 tctcagaaac atgtttttta caattgtact atttagtcat ngtcatttta ctataattta 240
 tctgaccatt tccctactgt taaaatactt aagacggttt ctgatttttc cactatttaa 300
 ataatgctgt gatgaatata tttaaaatct tctgatttct tacttttttc ccccttagat 360
 gcctggaagt ggtattttga ggtgaaagag tttgttcatt ttgaanatat ttctgtctct 420
 ctctcgacct gatgtgtana cgctcacttc cagtttagcag aaccacctta gtttgtgtct 480

<210> 94
 <211> 472
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(472)
 <223> n = A,T,C or G

<400> 94
 tcgagcggnc gcccgggcag ggtctgatgt cantcacaac ttgaagggat gccaatgatg 60
 taccaatccn atgtgaaatc tctcctctta tctcctatgc tgganaaggg attacaaagt 120
 tatgtggcng ataannaatt ccatgcacct ctantcatcg atgagaatgg agttcatgan 180
 ctggtgaacn atggtatctg aacccgatac cangttttgt ttgccacgat angantagct 240
 tttatttttg atagaccaac tgtgaacctt ccacacgtct tggacnactg anntctaact 300
 atccncaggg ttttattttg cttgttgaac tcttncagct nttgcaaact tcccaagatc 360
 canatgactg antttcagat agcattttta tgattccan ctcattgaag gtcttatnta 420

tntcntttttt tccaagccaa ggagaccatt ggacctcggc cgcgaccacc tn 472

<210> 95
 <211> 309
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(309)
 <223> n = A,T,C or G

<400> 95
 tcgagcggcc gcccgggcag agtgtcgagc cagcgtcgcc gcgatgggtg tgttggagag 60
 cgagcagttc ctgacgggaa tgaccagact ttcccaaaag tgccggacgt cgggcāncgt 120
 ctatatcacc ttgaagaant atgacgggtcg aaccaaacc attccaaaga aangtactgt 180
 gganggcttt gancccgag acaacnagtg tctgttaaga actaccgatn ggaaanaana 240
 anatcagcac tgtgggtgag ctccnagggg agttaataan ttccggatgg gcttattcna 300
 acctcctta 309

<210> 96
 <211> 371
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(371)
 <223> n = A,T,C or G

<400> 96
 tcgagcggcc gcccgggcag gtccaccact cacctactcc ccgtctctat agatttgctt 60
 gttctgggca gttctcagca atggaatcct actgtgtatc tttttgtgac tggttcttta 120
 actcagcatc acattttcaa ggttcaccca tgctgcagcc tggctccgta ctggtgacag 180
 tacttcattt ctctctccct tttgttcaga ccaagggtctc cctctgtccc caaggctaaa 240
 gtgcagttgg tgtgatcatg gctcactgca gcctcaaact cctggactca aacagtcctc 300
 ccactcagc ctcccaaagt gctgatntta taagttgcaa gccctgcacc cagcctgtat 360
 ctccagtttg t 371

<210> 97
 <211> 430
 <212> DNA
 <213> Homo sapien
 <220>
 <221> misc_feature
 <222> (1)...(430)
 <223> n = A,T,C or G

<400> 97
 tcganccggcc gcccgggcag gttntttttt tttntttttt nnnngntagt atttaaagan 60
 atttattaaa tcatcttatc accaaaatgg aaacatnttc caactagaaa catgcnacca 120
 tcatcttccc cagtcagtc ncaangtcca atatttttct tgctctgca gataaaaagt 180
 tcnnattttt ataccactc ttactcccc ccaaaatttt aattcngtcc tncctaaaa 240
 ttncnccggg taacaantta ccaaaatggc naaccaatta ttttaanaa aagttgcncn 300

```

ttnaaaangg aaactttntg gcaanttanc ctcttttccc ttcccacccc ccantttaag      360
gggaaaacaa tggcactttg ctcttgcttn aaccctaaaat tgtcttccaa aaactattaa      420
aaatgttnaa                                     430

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<210> 98
<211> 307
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(307)
<223> n = A,T,C or G

```

```

<400> 98
tcnaacggcc gccnnggcn gtctngcngc acctgtgcct canccgtcga tacctggtcg      60
attgggacan ggaanacaat ntgggttttca gggaggccac anatttgag aaacggatga      120
attctccttt attccgaant cagctccttg gtctccgtag anggtgatct tgaaattctc      180
ctgttttgaa aactttcttg aanaaacctt acctgctggt tgtatttggc ctcccactcg      240
gacaagtact cgttatccnn ggtactctta atgtgccac gtnaactccc cgggntggca      300
actggaa                                     307

```

```

<210> 99
<211> 207
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(207)
<223> n = A,T,C or G

```

```

<400> 99
gtccnggacc gatgttgcn aganntttct tgggccanta gggtcnaaaa aatgataanc      60
naggntnanc acgtgaagat ntntatanag tcttantnaa aacnctaga tctgnatgac      120
gataantcga anacnggggg aggggntgag gngaggtggn gtganggaag anntgttgat      180
aaaaganna gntgataaga annagac                                     207

```

```

<210> 100
<211> 200
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(200)
<223> n = A,T,C or G

```

```

<400> 100
acntnnacta gaantaacag ncnttctang aacactacca tctgtnttca catgaaatgc      60
cacacacata naaactccaa catcaatttc attgcacaga ctgactgtaa ttaattttgt      120
cacaggaatc tatggactga atctaatgcn nccccaaatg ttgttngttt gcaatntcaa      180
acatnnttat tccancagat                                     200

```

```

<210> 101

```


<211> 51
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(51)
 <223> n = A,T,C or G

<400> 101
 tcgagcggcc gcccgggcag gtctgaccag tgganaaatg cccagttatt g 51

<210> 102
 <211> 385
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(385)
 <223> n = A,T,C or G

<400> 102
 aacgtggtcg cggccgaagt ccatggtgct gggattaatc cactgtgaacn gtgactctga 60
 gttgagttgt ttttcaatct tctccaagcc tgtggactca tcctccacat ccttgggtag 120
 taggatgaac atgctgaaga tgctnathtt gaaaaggaa cctatgaatc ttacaattga 180
 atactgtcaa tgtttcccca tnacagaacg tggnccccca aggttccatc atctgcactg 240
 ggtttgggtg ttctgtcttg gttgactctt gaaaaggac atttctttt gttttcttga 300
 attcanggaa attttcttca tccactttgc ccacaaaagt taggcagcat ttaaccccca 360
 anggattttg ggtctgggtc cttcc 385

<210> 103
 <211> 189
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(189)
 <223> n = A,T,C or G

<400> 103
 agcgtggtcg cggccgaagt ctgcagcctg ggactgaccg ggaagctctg attatttacc 60
 caccacaggt angttgtgtt ctgaatctca agttcacagg ttaagggtac agcatcctca 120
 tcctccacgg ggttggantt gttgctggtg atgaanggtt tggggtggct ctgcataact 180
 gttgatctc 189

<210> 104
 <211> 181
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(181)
 <223> n = A,T,C or G

<400> 104
tcgagcggcc gcccgggcag gtccaggtct ccaccaangc accaccgtgg gaagctggta 60
attgatgccc accttgaagc cnntggggca ccatccncca actggatgct gcgcttgggt 120
ttgatgggtgg caatggcaca ttgactcttt tgggaaccac ttcaccacgg tacaacaggc 180
a 181

<210> 105
<211> 327
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(327)
<223> n = A,T,C or G

<400> 105
tcgagcggcc gcccgggcag gtcttctgtg gagtctgcgt gggcatcgtg ggcagtgggg 60
ctgccctggc cgatgctcan aaccccagcc tctttgtaaa gattctcatc gtgganatct 120
ttggcagcgc cattggcctc tttggggtca tcgtcgcaat tcttcanacc tccanaatga 180
anatgggtga ctanataata tgtgtgggtg gggccgtgcc tcacttttat ttattgctgg 240
ttttcctggg acagaactcg ggcgcgaaca cgcttanccg aattccaaca cactggcggg 300
cgttactagt ggatccgagc tcggtac 327

<210> 106
<211> 268
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(268)
<223> n = A,T,C or G

<400> 106
agcgtggctg cggccgangt ctggcgtgtg ccacatcggc cccacctcgc tttacaaaac 60
agtcctgaac ttnatctaataaaaattattg tacacnacat ttacattaga aaaaganagc 120
tgggtgtang aaaccgggct tgggtgttccc tttaagcgaa ngtggctcca cagttggggc 180
atcgctcgctt cctcnaagca aaaacgccaa tgaacccna aggggggaaaa aggaatgaag 240
gaactgnccn gggangnccg ctccgaaa 268

<210> 107
<211> 353
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(353)
<223> n = A,T,C or G

<400> 107
tcgagcggcc gcccgggcag gtggccaggc catgttatgg gatctcaacg aaggcaaaaca 60
cctttacacn ctagatgggtg gggacatcat caacgccctg tgcttcagcc ctaaccgcta 120

```

ctggctgtgt gctgccgcag gccccagcat caagatctgg gatttanagg gaaagatcnt 180
tgttnnatgaa ctgaancnta aattatcagt tccannacca ngcaaaaacc acccngtgca 240
ctccctggcc tggctctgtg atgggacctc gggcgcgaaac acgctnancc caattccanc 300
acactgggcg gncgttacta ntggatccga actcnggtac caancttggc gtt 353

```

<210> 108

<211> 360

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(360)

<223> n = A,T,C or G

<400> 108

```

agcgtggtcg cggccgaagt cctggcctca catgaccctg ctccagcaac ttgaacagga 60
naagcagcag ctacatcctt aaggcccgga aagttagatg aagatttggg tcctgcattg 120
ncctgcctcc cacctatctc tccnaatta taaacagcct ccttgggaag cagcagaatt 180
taaaaactct ccnctgccc tnttgaacta cacaccnacc gggaaaacct tttcanaat 240
ggcacaaaaa tncnagggaa tgcatttcca tgaangaana aactgggtta cccaaaatta 300
ttgggttggg gaaatccngg gggggttttn aaaaaagggc aanccnccaa anaaaaaac 360

```

<210> 109

<211> 101

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(101)

<223> n = A,T,C or G

<400> 109

```

atcgtggtcn cggccgaagt cctgtgtcct ggatgggccc tgtgcancga atccgttggc 60
gactcctaac taccaaaaaa angactctcg gaagaaattt c 101

```

<210> 110

<211> 300

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(300)

<223> n = A,T,C or G

<400> 110

```

ccanggaaac ccagagtcac atgagatagg gtggccttcg ggacaggggg tcagangaat 60
ggtacatgga tctcagcccc tgatggacac ggaacagggt tggtcagaac tcccangatt 120
ctgcattccan gatccagtct ctatagaagt tatggatcat tccttcattt cattcccccc 180
ttcatgaaaa aacttctgaa caagcctttt ttctcacttt ggggccctgt ttggcncaag 240
gtnttnantt ggggaaaaaa aaacaaatcc nttccttan ccctccgtgg ggaatgacct 300

```

<210> 111

<211> 366
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(366)
<223> n = A,T,C or G

<400> 111
cgagcggccg cccgggcagg tccttgtgtt gccatctgtt ancattgatt tctggaatgg 60
aacanctttc tcaaagtttg gtcttgctan tcatgaagtc atgtcagtgt ctttaagtcac 120
tgctgtctac ttctttaccc agggaaatata ctgcataagt ttctgaacac ctgttttcan 180
tattcactgt tcctctcctg cccaaaattg gaagggacct catttaaaaa tcaaatttga 240
atcctgaaan aaaaacngga aatntttctc ttggaatttg gaatagaatt attcanttga 300
ataacatggt ttttccccct gccttgctct tcncaanaac atctggacct cggccgcgac 360
acctta 366

<210> 112
<211> 405
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(405)
<223> n = A,T,C or G

<400> 112
ctgactncta aactttcta tcnatcaana taactactct ccttccgtct tncagagtgt 60
tcacaataaa tctgtgaatc tggcatacac agttgctgga aaattgttct tcctccacna 120
aaaggtcaat tgcttcnccn atgaaanaag ataaattgtt catccatcac tncatgaacca 180
tccaaaacgc cggcggaatt attnccccgt tattatgggg aacggaattt tnaataaatt 240
tggaangaa tggggccttt attgttttgt tttccccctt tcttggcatt gattggggccg 300
caatgggccc cctcgctcan aanntgcccc gggggccggc gctccaaaac cgaaattccc 360
anccacactt ggggggcccgt tactanttgg atccgaactc ggtta 405

<210> 113
<211> 401
<212> DNA
<213> Homo sapien

<400> 113
ggatagaaga gtatatgggt ttggcaccac ggggtggata ggcaaacat ttggttgata 60
aggcgagat tctgaactaa cttgtaaggc ttgtctgggt ttaggacagg taaaatgggg 120
gaatggtaag gagagtttat aggttttagg agcccatgct gtagcaggca agtgataaca 180
ggctttaatc ctttcaaagc atgctgtggg atgagatatt ggcatttgag cggggtaagg 240
gtgattaggt tttaatgaga tggtaagggg tgcgatgacc ggtccgcaa ggaagggag 300
tagaggtatc ttatacttgt ggggttaagg tgggggggat ataagagggg ggacgccaaa 360
ggaggccttg gattaggaat aaggggcggc aatgagatgc a 401

<210> 114
<211> 401
<212> DNA
<213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(401)
 <223> n = A,T,C or G

<400> 114
 angtcacag gangcangag gccaggctcc gtcccancca gtccatgatg ttgaagagga 60
 ggaagcagca catggggttg aagaactgac tccacttccc aggactgggtg gagctgggtca 120
 ccatggctgt ggtggcgggg aagacggaca gggtgacttc tggaagacag tgaagactga 180
 aggttttcct ggcttctggg gctcatctgg ctctgattcc ggctccttct ccagggtcaag 240
 atccagggtt cagagctact ttcttggggg actactnggg aatcccgttc tcctctgggg 300
 gtngaggggg gacggggnaa gggncatgct tgtgacccag gtttcccacc tcggcccgcg 360
 accacgctaa ggcccgaatt ncagcacact tggcgccccg t 401

<210> 115
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 115
 atccctgtaa gtctattaaa tgtaaataat acatacttta caacttctct tagtcggccc 60
 ttggcagatt aaatctttgc aaaattccat atgtgctatt gaaaaatgaa ataaaacctc 120
 agatgtctga attcttattt caaatacagt tatataatta ttttaaatta caatatacaa 180
 tttctgttaa atacaactgt taagggatcc tgagaacaat tataagatta taataatata 240
 taaaaactaa cttctgaaat gacatgggtt gtttccttcc caccctccta cctctctaaa 300
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<210> 116
 <211> 301
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(301)
 <223> n = A,T,C or G

<400> 116
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 aatatcccta ggaggagtta gcatggannn tgatcatttt cttngnactc ctttangaca 120
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 t 301

<210> 117
 <211> 383
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(383)

<223> n = A,T,C or G

<400> 117

aattgcaact	ggactttttat	tgggcagtta	cnacaacnaa	tgttttcana	aaaatatttg	60
gaaaaaatat	accacttcat	agctaagtct	tacagagaan	aggatttgct	aataaaactt	120
aagttttgaa	aattaagatg	cnggtanagc	ttctgaacta	atgccacag	ctccaaggaa	180
nacatgtcct	atttagttat	tcaaatacca	gttgagggca	ttgtgattaa	gcaaacaata	240
tatttggtan	aactttgntt	ttaaattact	gntncttgac	attacttata	aaggagnctc	300
taactttcga	tttctaaaac	tatgtaatac	aaaagtatan	ntttcccat	tttgataaaa	360
gggcnanga	tactgantag	gaa				383

<210> 118

<211> 301

<212> DNA

<213> Homo sapien

<400> 118

ctgctagaat	cactgccgct	gtgctttcgt	ggaaatgaca	gttccttggt	ttttttgttt	60
ctgtttttgt	tttacattag	tcattggacc	acagccattc	aggaactacc	ccctgcccc	120
caaagaaatg	aacagttgta	gggagacca	gcagcacctt	tcctccacac	accttcattt	180
tgaagttcgg	gtttttgtgt	taagttaatc	tgtacattct	gtttgccatt	gttacttgta	240
ctatacatct	gtatatagtg	tacggcaaaa	gagtattaat	ccactatctc	tagtgcttga	300
c						301

<210> 119

<211> 401

<212> DNA

<213> Homo sapien

<400> 119

taaggacatg	gacccccggc	tgattgcatg	gaaaggaggg	gcagtgttgg	cttgtttgga	60
tacaacacag	gaactgtgga	tttatcagcg	agagtggcag	cgctttgggt	tccgcatgtt	120
acgagagcgg	gctgcgtttg	tgtggtgaat	ggggaggaaa	tgtcactgcc	gaagaccaa	180
aacaagcttc	ttggtataaa	agactcttac	agaatatgtg	tattgtaatt	tattgatctg	240
gatgcttaag	tgtcatggac	agtaaataaa	tttgaacttt	atgtttgagg	acatgacatt	300
gggtttgaaa	atataaactg	cttttgagca	gtttaagtca	gggcatttga	gaataaaaata	360
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<210> 120

<211> 301

<212> DNA

<213> Homo sapien

<400> 120

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gaagctctat	ataaatccaa	gacaagcaac	aaacccttga	tgattattca	tcacttgggt	180
gagtgtccac	acagtcaagc	tttaagaaa	gtgtttgctg	aaaataaaga	aatccagaaa	240
ttggcagagc	agtttgcct	cctcaatctg	gtttatgaaa	caactgacaa	acacctttct	300
c						301

<210> 121

<211> 2691

<212> DNA

<213> Homo sapien

<400> 121

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aggcttttat	ggggccctgt	ccaggtagaa	aagaaatggt	atgtagagct	tagatttccc	2640
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<210> 122

<211> 683

<212> PRT

<213> Homo sapien

<400> 122

Met Ala Leu Phe Val Arg Leu Leu Ala Leu Ala Leu Ala Leu

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Gly Pro Ala	Ala Thr Leu Ala Gly	Pro Ala Lys Ser Pro Tyr	Gln Leu
20	25	30	
Val Leu Gln	His Ser Arg Leu Arg Gly Arg	Gln His Gly Pro	Asn Val
35	40	45	
Cys Ala Val	Gln Lys Val Ile Gly Thr Asn Arg	Lys Tyr Phe Thr	Asn
50	55	60	
Cys Lys Gln	Trp Tyr Gln Arg Lys Ile Cys Gly Lys	Ser Thr Val Ile	
65	70	75	80
Ser Tyr Glu	Cys Cys Pro Gly Tyr Glu Lys Val	Pro Gly Glu Lys	Gly
85	90	95	
Cys Pro Ala	Ala Leu Pro Leu Ser Asn Leu Tyr Glu Thr	Leu Gly Val	
100	105	110	
Val Gly Ser	Thr Thr Thr Gln Leu Tyr Thr Asp Arg	Thr Glu Lys Leu	
115	120	125	
Arg Pro Glu	Met Glu Gly Pro Gly Ser Phe Thr Ile Phe	Ala Pro Ser	
130	135	140	
Asn Glu Ala	Trp Ala Ser Leu Pro Ala Glu Val Leu Asp	Ser Leu Val	
145	150	155	160
Ser Asn Val	Asn Ile Glu Leu Leu Asn Ala Leu Arg Tyr	His Met Val	
165	170	175	
Gly Arg Arg	Val Leu Thr Asp Glu Leu Lys His Gly Met	Thr Leu Thr	
180	185	190	
Ser Met Tyr	Gln Asn Ser Asn Ile Gln Ile His His Tyr	Pro Asn Gly	
195	200	205	
Ile Val Thr	Val Asn Cys Ala Arg Leu Leu Lys Ala Asp	His His Ala	
210	215	220	
Thr Asn Gly	Val Val His Leu Ile Asp Lys Val Ile Ser	Thr Ile Thr	
225	230	235	240
Asn Asn Ile	Gln Gln Ile Ile Glu Ile Glu Asp Thr Phe	Glu Thr Leu	
245	250	255	
Arg Ala Ala	Val Ala Ala Ser Gly Leu Asn Thr Met Leu	Glu Gly Asn	
260	265	270	
Gly Gln Tyr	Thr Leu Leu Ala Pro Thr Asn Glu Ala Phe	Glu Lys Ile	
275	280	285	
Pro Ser Glu	Thr Leu Asn Arg Ile Leu Gly Asp Pro Glu	Ala Leu Arg	
290	295	300	
Asp Leu Leu	Asn Asn His Ile Leu Lys Ser Ala Met Cys	Ala Glu Ala	
305	310	315	320
Ile Val Ala	Gly Leu Ser Val Glu Thr Leu Glu Gly Thr	Thr Leu Glu	
325	330	335	
Val Gly Cys	Ser Gly Asp Met Leu Thr Ile Asn Gly Lys	Ala Ile Ile	
340	345	350	
Ser Asn Lys	Asp Ile Leu Ala Thr Asn Gly Val Ile His	Tyr Ile Asp	
355	360	365	
Glu Leu Leu	Ile Pro Asp Ser Ala Lys Thr Leu Phe	Glu Leu Ala Ala	
370	375	380	
Glu Ser Asp	Val Ser Thr Ala Ile Asp Leu Phe Arg Gln	Ala Gly Leu	
385	390	395	400
Gly Asn His	Leu Ser Gly Ser Glu Arg Leu Thr Leu Leu	Ala Pro Leu	
405	410	415	
Asn Ser Val	Phe Lys Asp Gly Thr Pro Pro Ile Asp	Ala His Thr Arg	
420	425	430	
Asn Leu Leu	Arg Asn His Ile Ile Lys Asp Gln Leu	Ala Ser Lys Tyr	
435	440	445	

Leu Tyr His Gly Gln Thr Leu Glu Thr Leu Gly Gly Lys Lys Leu Arg
 450 455 460
 Val Phe Val Tyr Arg Asn Ser Leu Cys Ile Glu Asn Ser Cys Ile Ala
 465 470 475 480
 Ala His Asp Lys Arg Gly Arg Tyr Gly Thr Leu Phe Thr Met Asp Arg
 485 490 495
 Val Leu Thr Pro Pro Met Gly Thr Val Met Asp Val Leu Lys Gly Asp
 500 505 510
 Asn Arg Phe Ser Met Leu Val Ala Ala Ile Gln Ser Ala Gly Leu Thr
 515 520 525
 Glu Thr Leu Asn Arg Glu Gly Val Tyr Thr Val Phe Ala Pro Thr Asn
 530 535 540
 Glu Ala Phe Arg Ala Leu Pro Pro Arg Glu Arg Ser Arg Leu Leu Gly
 545 550 555 560
 Asp Ala Lys Glu Leu Ala Asn Ile Leu Lys Tyr His Ile Gly Asp Glu
 565 570 575
 Ile Leu Val Ser Gly Gly Ile Gly Ala Leu Val Arg Leu Lys Ser Leu
 580 585 590
 Gln Gly Asp Lys Leu Glu Val Ser Leu Lys Asn Asn Val Val Ser Val
 595 600 605
 Asn Lys Glu Pro Val Ala Glu Pro Asp Ile Met Ala Thr Asn Gly Val
 610 615 620
 Val His Val Ile Thr Asn Val Leu Gln Pro Pro Ala Asn Arg Pro Gln
 625 630 635 640
 Glu Arg Gly Asp Glu Leu Ala Asp Ser Ala Leu Glu Ile Phe Lys Gln
 645 650 655
 Ala Ser Ala Phe Ser Arg Ala Ser Gln Arg Ser Val Arg Leu Ala Pro
 660 665 670
 Val Tyr Gln Lys Leu Leu Glu Arg Met Lys His
 675 680

<210> 123

<211> 1205

<212> DNA

<213> Homo sapien

<400> 123

ccagtcagca	gagggacagg	aatcattcgg	ccactgttca	gacgggagcc	acacccttct	60
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cgctccaggc	cagtgagttg	gttgtcactt	actttttctg	tggggaagaa	attccatacc	180
ggaggatgct	gaaggctcag	agcttgaccc	tgggccactt	taaagagcag	ctcagcaaaa	240
agggaaatta	taggtattac	ttcaaaaaag	caagcgatga	gtttgcctgt	ggagcggtgt	300
ttgaggagat	ctgggaggat	gagacggtgc	tcccgatgta	tgaaggccgg	attctgggca	360
aagtggagcg	gacgattga	gccctgcggt	ctggccttgg	tgaactgttg	gagcccgaag	420
ctcttgtaga	ctgtcttgcc	tgtgagcaac	tgcgacaaaa	cattttgaag	gaaaattaaa	480
ccaatgaaga	agacaaagtc	taaggaagaa	tcggccagtg	ggccttcggg	agggcggggg	540
gaggttgatt	ttcatgattc	atgagctggg	tactgactga	gataagaaaa	gcctgaacta	600
tttattaaaa	acatgaccac	tcttggttat	tgaagatgct	gcctgtattt	gagagactgc	660
catacataat	atatgacttc	ctagggatct	gaaatccata	aactaagaga	aactgtgtat	720
agcttacctg	aacaggaatc	cttactgata	tttatagaac	agttgatttc	ccccatcccc	780
agtttatgga	tatgtgctt	taaacttgga	agggggagac	aggaagtttt	aattgttctg	840
actaaactta	ggagttgagc	taggagtcgc	ttcatggttt	cttcactaac	agaggaatta	900
tgctttgcac	tacgtccctc	caagtgaaga	cagactgttt	tagacagact	ttttaaatag	960
gtgccctacc	attgacacat	gcagaaattg	gtgcgttttg	tttttttttc	ctatgctgct	1020
ctgttttgtc	ttaaaggctc	tgaggattga	ccatgttgcg	tcatcatcaa	cattttgggg	1080

gttgtgttg	atgggatgat	ctgttcgaga	gggagaggca	gggaaccctg	ctccttcggg	1140
ccccaggttg	atcctgtgac	tgaggctccc	cctcatgtag	cctccccagg	cccagggccc	1200
tgagg						1205

<210> 124
 <211> 583
 <212> DNA
 <213> Homo sapien

<400> 124						
ccaagaagca	gtggccttat	tgcatcccaa	accacgcctc	ttgaccaggc	tgccctccctt	60
gtggcagcaa	cggcacagct	aattctactc	acagtgcctt	taagtgaaaa	tggtcgagaa	120
agaggcacca	ggaagccgtc	ctggcgctcg	gcagtcctg	ggacgggatg	gttctggctg	180
tttgagattc	tcaaaggagc	gagcatgtcg	tggacacaca	cagactattt	ttagattttc	240
ttttgccttt	tgcaaccagg	aacagcaaat	gcaaaaactc	tttgagaggg	taggaggggtg	300
ggaaggaaac	aaccatgtca	tttcagaagt	tagtttgtat	atattattat	aattcttataa	360
ttgttctcag	aatcccttaa	cagttgtatt	taacagaaat	tgtatattgt	aatttataaat	420
aattatataa	ctgtatttga	aataagaatt	cagacatctg	aggttttatt	tcatttttca	480
atagcacata	tggaattttg	caaagattta	atctgccaa	ggccgactaa	gagaagttgt	540
aaagtatgta	ttattttacat	ttaatagact	tacagggata	agg		583

<210> 125
 <211> 783
 <212> DNA
 <213> Homo sapien

<400> 125						
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ccttttctcta	aagtttattc	ccaaaaacag	gtagcattcc	tgattgggca	gagaagagga	180
tatttttcagc	ccacatctgc	tgaggtatg	tcattttctc	ccatcttcac	tgtgactagt	240
aaagatctca	ccacttctct	ttggaatttc	caactttgct	tgtgattgaa	tgtcacttcg	300
tgaatttgta	ttatgtcaga	tcacttggca	ttgctcttcc	atatgcatca	agttgccagg	360
cactgttgcg	ctgtcgggcc	cactggaatc	cacgggggtg	aaacaaattc	aattatgctt	420
ttacagatcc	tgctcaaaaa	aggtttcaac	tgcttaacca	agtacagctc	attcttccac	480
cttcttactc	tgcaacaaaa	ccaagtgcc	catactacag	gtaggtgccg	agaaattccg	540
cagcagaaaa	tcacaaatca	tttctgaaac	ctccttgcta	acaaaagttc	tttttttctc	600
caaacagcat	ataaaatgat	caagtcttga	aagagaaaag	aagcaaagta	gcaaatacat	660
caacaattca	ctatcagaaa	cacataaaat	cccagagaga	gagaaggcag	tatctctgaa	720
tcattggatgg	acttggaag	ttcggaagga	ttccgagtgc	ttcctttcag	aaagacaatt	780
ctg						783

<210> 126
 <211> 604
 <212> DNA
 <213> Homo sapien

<400> 126						
cctgctagaa	tcactgccgc	tgtgctttcg	tggaaatgac	agttccttgt	tttttttgtt	60
tctgtttttg	ttttacatta	gtcattggac	cacagccatt	caggaactac	cccctgcccc	120
acaaagaaat	gaacagttgt	agggagaccc	agcagcacct	ttcctccaca	caccttcatt	180
ttgaagttcg	ggtttttgtg	ttaaagttaa	tctgtacatt	ctgtttgcca	ttgttacttg	240
tactatacat	ctgtatatag	tgtacggcaa	aagagtatta	atccactatc	tctagtgcct	300
gacttttaaat	cagtacagta	cctgtacctg	cacggtcacc	cgctccgtgt	gtcgccctat	360
attgagggct	caagctttcc	cttgtttttt	gaaaggggtt	tatgtataaa	tatattttat	420

gcctttttat	tacaagtctt	gtactcaatg	acttttgtca	tgacattttg	ttctacttat	480
actgtaaatt	atgcattata	aagagttcat	ttaaggaaaa	ttacttggta	caataattat	540
tgtaatav	agatgtagcc	tttattaaaa	ttttatattt	ttcaaaaaaa	aaaaaaaaaa	600
aaaa						604

<210> 127

<211> 417

<212> DNA

<213> Homo sapien

<400> 127

ctgagcctct	gtcaccagag	aaggctgagg	ccccaatggc	acacctcaga	aacctacacc	60
ccgaggctgg	acggctggac	tcctgagcac	aagctccctc	tcgcaccctt	tgccagacag	120
tttgctccca	atttcaaact	gacctaaagg	tcttactcct	ggattttttg	tttttaaac	180
ttctccagc	cagtctctgg	gagggcatga	tttagagaagt	gctcctttgc	tgatggagga	240
ggggacctaa	ggaagaagg	ggatcccagg	tgctcctctc	ctaattgatc	ctccccacct	300
agtttccctt	gcctctcttc	cttctaccag	gtcatgtttt	ttactctctg	ccccttctgc	360
ctcctagcat	ttcaaaaact	gtagagtgc	ccccatagtg	gacattttta	gtccagg	417

<210> 128

<211> 657

<212> DNA

<213> Homo sapien

<400> 128

ccacactgaa	atgcagttta	atgtggaaac	ttttctaaat	acatattgta	gcatctttgg	60
acatcaacgt	gtggcctgaa	atttttatta	ttgttccttc	ttctcctcca	ttaaaaaaaa	120
aatctccttg	tggtatttag	tcatttacca	ttaacacata	ttatggctta	aaaagggcc	180
tccttccctt	ttctgagctg	gagttcttca	cgtcacctt	tgatgcattg	ccttagctgg	240
ttactttgcc	ttggtttgg	catgaacatt	ggggttagtg	gcctggcaac	ttgaatgc	300
atggaaagaa	caatgccaa	tgatctgaca	taatacaaat	tccgaagtga	cattcaatca	360
caagcaaagt	tggaattcc	aaagagaagt	ggtgagatct	ttactagtca	cagtgaagat	420
gggagaaaat	gacatacctg	cagcagatgt	gggctgaaaa	tatcctcttc	tctgccaat	480
caggaatgct	acctgtttt	gggaataaac	tttagagaaa	ggaagggcc	aaactacgac	540
ttggctttct	gaaacggaag	cataaatgtt	cttttcctcc	atttgtctgg	atctgagaac	600
ctgcatttgg	tattagctag	tggaagcagt	atgtatggtt	gaagtgcatt	gctgcag	657

<210> 129

<211> 1220

<212> DNA

<213> Homo sapien

<400> 129

cgcgtgctcg	gctcacacca	acaaggcaag	ccaaaggcgc	ccctccccag	agggatccct	60
aacgtgcccc	gcatgtagat	tctggactaa	cagacaacat	acattcaccg	ctggtcaccc	120
agatcctcat	tcaaaccac	tgctggcaca	tccctttcct	tactttgccc	tgtgctacca	180
gccacggaag	gagcctctct	tgttttttct	ataaaatggg	taggcaggag	aaaagcaggt	240
gccctaagat	tgctctaagg	cccagcatgt	ggttacagtt	ctctgacttg	cagaacctgc	300
cagggtgatg	gctacaagtt	atcctcgtgc	tgatctgtct	cattactaag	ttaatggaga	360
agacagaaag	gtaaaaatca	cgtgtagcaa	gaacaactct	tatttcacaa	actcaggtat	420
gaaacgaaac	gcctgtcctt	catggaactg	cttttagctc	ctgtcttttc	aaaatggcag	480
agggagtctc	tcacacact	ttttccctgg	aggccaagg	ctaggggtag	aaaggggagg	540
ggtggggcta	ccaggtagca	ggtgacaacc	caaggtcaga	ggagtggccc	tcagtgtcat	600
ctgtccacag	tgatacctgc	caagatgacc	actgaccac	atctggtctt	agtcattggt	660
ctcctcagat	ttctggggcc	acctgcaagc	ccattccat	tcctacagat	ctctcagcca	720

cctgtaagtc	ctttgtgaag	atgtgggtga	cacaggggga	caggaaaacc	cattttctcaa	780
cccagatcca	tgtctccact	gcttctactc	tgggttggga	ttcaggaaga	caggcacagt	840
cctctctgtt	catagaaaca	cctgccagtg	tcaaggattc	cagtcagggtg	tctatcccaa	900
ctggtcaggg	agagaagggc	agaccattc	tcaaagacca	ccatgtccaa	ggtctgacag	960
ctccccactg	gctgccccca	caggggcttt	aggctgggtc	gggtcatggg	gaagcgtccc	1020
tcttatcgct	ggtctgtgtt	ctcctggatt	tggatatctat	gttggtagca	ctcctggcct	1080
tttatctaaa	ggactttggc	ttttgtaaat	cacaagccaa	taatagactt	ttttctcccc	1140
ctctgttttt	tgtctgtgtc	tctctgcctt	gagactgcct	tgagacagtg	cttgccttga	1200
gagagtgagc	caattaacag					1220

<210> 130

<211> 1274

<212> DNA

<213> Homo sapien

<400> 130

ccatatgagt	ttgccatctc	catggatgcc	atttcaatgc	cttcagggta	atcattctct	60
ccccaaagac	tgcccacggg	gtcatcactc	ctgtgacgaa	atgagggctg	gattgaagat	120
gttctgctga	gcacccccct	ggctcatctt	gggtctcag	aagagccata	atcatgacca	180
ttctcagcat	ctgaataatc	aggttctctc	caagtgtctg	gcaagttctg	attgtcctca	240
gcaactgggat	agtctggctc	ccccaaaaag	ggtggagagt	taggttgaat	gtcagcgctt	300
ggataatcag	gctttccag	agagtctgcg	tatggattga	ttctaaaact	tgtatgttcc	360
agattctttc	tggatcctgg	atggttcaaa	ttggctctgg	gtccaggatg	atcagagttg	420
ctctgagctc	cagggtagtc	cgtttctaa	gagccaaaat	gatctggatg	tgttctggag	480
cctgcatagt	ttccactgct	gctggagcct	gcaaaatcag	gatttcgttg	agatccaggg	540
tagtctgggt	gtctggatga	tgtcgggtgg	taggyatgac	tctgaaatc	actataatct	600
ggctctggta	gagaggtagg	atggctctggg	cttgttctag	aggctgcaga	gtatgcattg	660
cttctgggtc	cagaatagtc	tggattactc	agagatctag	gataatttgg	ttctgccaga	720
gaccacggat	agtctggacg	tgtctctggg	gctacagagt	atggattgct	cctgggtgccg	780
gggtaatctg	gattgttcag	aggacctgga	acatctggat	aaccttgagt	tttcaaatac	840
ccctgcgtac	ggttctgaga	ccctgaatag	tcagggtaat	ctgggtcttc	ctcagaccag	900
ttattcctgt	agtaggcaga	catgttggtg	tggactcttc	accctggagt	ggtaaactgt	960
cccagcattt	gcaattactc	agggatcttt	tttttttcac	ttttttgccc	ttattgttct	1020
tgctttgtcc	caagtagatg	caaattgttg	gcaaaccaac	ttgatcttaa	gatgttggtg	1080
agaacactgg	agtcacgtgt	ccatgggtcc	ttcaggctgg	cttttgatgg	gagctgggat	1140
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ttgctgactg	caggcagagc	ctcatgtcct	cctggcgctc	ctgttgccgc	tgcttgcgct	1260
ggccctcggg	tcga					1274

<210> 131

<211> 554

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(554)

<223> n = A,T,C or G

<400> 131

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gaaattcctc	ctttctacct	ctctgggact	ctgagacagg	aaatcttcaa	ggaggagttt	120
ttccctcccc	actattctta	ttctcaaccc	ccagaggaac	caaggctgct	gtaccacact	180
caggacaga	actccacact	atagtgggaa	agcttcaggg	acccctcctt	ttagtgtctc	240
gggctcacct	atgctactgg	tccttttggc	aaaaaaggaa	aatgatagag	ccagggttgc	300

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ccctgatgta gcagccttac tgtggagggg ccaaagctgg tgttcagagc tcaccaagg 360
agggaggtga taaggtgtca tgcgttctgc tgaaccact ggntgggatg aacatgaggc 420
ttgggggtgag ggaaaccaag taggggttgg agaaggagca gcacctttgt macacctggc 480
taccatagc tagctttctg ccctcaaaaa ctcagccttc aagggatcca gccacacac 540
gccacaggca gcag 554

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<210> 132

<211> 787

<212> DNA

<213> Homo sapien

<400> 132

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gaggctggaa tccttcagcc ccagagccca gggaccactc cagtagatgc agagaggggc 120
ctgcccaggg gtcagggcag tgggtracac tggtgacatc aagaatatca gggctgggga 180
ggcatctttg tttcctgggt ccctcctcaa agttgctgac actttgggga cgggaagggg 240
tagaagtagg gctgctcctt ttggagctgg agggaataga cctggagaca gagttgaggc 300
agtggggctg tccaggttct aagcatcaca gcttctgcac tgggctctga ggagattctc 360
agccagagga tccagcctc ctccctccctc aaatgtcagt ccaagcaaat accaaagcaa 420
cgcacgcatt ttgtggaagt caattagaga tgtggggagc tatcggagac aagcactatt 480
gtaccttttc acctccacac ttgtcacaag cagggactgt ctctcccca ctttgcttgc 540
cacgcctgcc atggcttgag ctgggggtgag gagggtgctt tatcttcttt gggagatcct 600
gactggttgc gcacttgcta agggcaggaa gtctggaggg ctgcaggaat ggtgccgttg 660
ataaacaggt ggacttataa tcatcatgca ctgcaattgt agaacatagt ctctgcctt 720
ttctcatttg tataattgtc tgggtcaata ttctcccaat attgggaggg gctctgcagc 780
cctccag 787

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<210> 133

<211> 219

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(219)

<223> n = A,T,C or G

<400> 133

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tactgctcta agttttgtna aatttttcat attttaattt caagcttatt ttggagagat 60
aggaaggtca tttccatgta tgcataataa tcctgcaaag tacaggtagt ttgtctaaga 120
aacattggaa gcagggttaa tgttttgtaa actttgaaat atatggtcta atgtttaagc 180
agaattggaa nagactaata tcggttaaca aataacaac 219

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<210> 134

<211> 234

<212> DNA

<213> Homo sapien

<400> 134

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gattttaaaa acatcatgac tttgaactga aaaacataca cgtttagcac acaaattattg 60
taatatgaat gaactccaac tccatttgaa aacatgtgaa tcaaagtaca gttttagaag 120
ttagtaattc acatttaagc aagttagcgc cttagctgaat acagcctttg taaaaaagag 180
acttagtgca tattttaatg gtacattgtg gttttgtacc atttggttga gttg 234

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<210> 135

<211> 414
 <212> DNA
 <213> Homo sapien

<400> 135
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 gctcaccggg aggctgtgga gcactttctg gaggccctga acatgcagag gaaaagccgg 120
 ggcccccggt gtgaaggagg tgccatgtcg gagaacatct ggagcaccct gcgtttggca 180
 ttgtctatgt taggccagag cgatgcctat ggggcagccg acgcgcggga tctgtccacc 240
 ctcctaacta tgtttggcct gccccagtga cagtgggacg ggctgccctg tgagtgtcca 300
 cctggggatt aaatatgtct tcaacaaggg aggcctggct tctacaatgg tttaggtaaa 360
 ggggcctttg aagtagttct ggccaggctt gcaatacaca caacacaaga gccca 414

<210> 136
 <211> 461
 <212> DNA
 <213> Homo sapien

<400> 136
 gaagtgatta ataggtttat ttgcatatac acagagaaga gtcagcattg ttgggtgaga 60
 agaggcaggc tgtgaggagg taaggcttca gcagaggaag gcaccttgac agacaacacg 120
 agactcctat taaatcagca cagttgcaa cttcacctgc ctcaagccaa cagctcattg 180
 aactcatatg tcgattgaga atcatttaca aaaccaggag agaaacaatg ggaagagcaa 240
 cggctctctca tccttgacc tgacactcaa aacattatgt acaggatgca ggaacaaaat 300
 ctgtctgac agtgccctct cctgctggga aaaacacca tcacggaaga atttggggat 360
 taaatatgtc ttcaacaagg gaggcctggc ttctacaatg gtttaggtaa aggggccttt 420
 gaagtagttc tggccaggct tgcaatacac acaacacaag a 461

<210> 137
 <211> 269
 <212> DNA
 <213> Homo sapien

<400> 137
 atagcaaatt gacacaaatt acaaattgtgt gtgcgtggga cgaagacatc tttgaaggtc 60
 atgagtttgt tagtttaaca tcatatattt gtaatagtga aacctgtact caaaatataa 120
 gcagcttgaa actggcttta ccaatcttga aatttgacca caagtgtctt atatatgcag 180
 atctaattga aaatccagaa cttggactcc atcgttaaaa ttatttatgt gtaacattca 240
 aatgtgtgca ttaaatatgc ttccacagt 269

<210> 138
 <211> 452
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(452)
 <223> n = A,T,C or G

<400> 138
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 taatcttccc tggttaactat gcaacatttg gacagaaagg cacacaaaaa agtttaataa 120
 tttcatgtgc caatctggaa aaaaataatt taaatcaaca gaacagacag tacatctaca 180
 caaatgagga aagcagaaaa gatacctcac attcatttat cttaggtttc aaagtggctt 240

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caatgctaaa gtaaattgtat taacatttgg aaaatacaag acaatttttt tgtttgtttt 300
caattttttt agctctatac aatgattaca acataagaca aaaaaaaaaa aaaaacacaa 360
aaaacaaaac aaaaaaggag ttcaggactt gttatcagt tccaagtggc taanaactgg 420
ttcccataac aagcattgaa agttaaggcc cc 452

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<210> 139
<211> 474
<212> DNA
<213> Homo sapien

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<400> 139
tgtgcctcat tgagggttaca attgaacag atgtgagcac ctgagagact ttccctgatt 60
atattcctcc acaaacact gtaccatatt accttatttt atcttcttga aattcttatt 120
cattggcttg tttgttgtct ctttgcatta gatataatga agctccttgg cataaatttg 180
acattggtag gggactgaca ttctaacctg gcccaggccc taggagagag ataactccac 240
aaagcagcac atactatctt aggttagcag ggagctaact caccatgtag cagatgaaaa 300
aaaccaaac cagcactgtg cataaatacc acttgccaag aagtcaggtc ctgggcaacc 360
gagaatcaac ctccagcaca acgcagggtg ctgggctctg ttccccctta gccaccacct 420
cagcctctcc cctccccctg cccaagtgcc caagagcttg gctctctgtg cttt 474

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<210> 140
<211> 487
<212> DNA
<213> Homo sapien

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<400> 140
cttccctgcc tcgtgttctt gagaaacgga ttaatagccc tttatcccc tgcaccctcc 60
tgcaggggat ggcactttga gccctctgga gccctcccc tgcagagct tactctcttc 120
agactttctg aatgtacagt gccgttggtt gggatttggg gactggaagg gaccaaggac 180
actgacccca agctgtcctg cctagcgtec agcgtcttct aggaggggtg ggtctgcctg 240
tcttggtgtg gttgggttgg cctgttttgc tgtgactacc cccccccctc cccgaaccga 300
gggacggctg cctttgtctc tgcctcagat gccacctgcc ccgcccatgc tccccatcag 360
cagcatccag actttcagga agggcagggc cagccagtc agaaccgcat ccctcagcag 420
ggactgataa gccatctctc ggaggggccc ctaataccca agtggagtct ggttcacacc 480
ctggggg 487

```

```

<210> 141
<211> 248
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1) ... (248)
<223> n = A,T,C or G

```

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<400> 141
ttaaagatgg ggaaatgagg cctgnaaata gaaaagattt gcctagagtc acacacactg 60
tcaggtcagg tagagtcaaa atcaggcacc ccgactcaca gactgcttca cattgccatc 120
agagattgtc ctgcaacaat attatgttta gttctactgc agaatagataa ctggatctta 180
cccccttgc ctgatctggc cacaaacttg ttttccagg ctttccatta ggctctcttc 240
agctaatt 248

```

```

<210> 142
<211> 173

```

<212> DNA

<213> Homo sapien

<400> 142

tactaagatt gtccaagcct cccctcttaaa actttctttc ccttttagagg aatcattact	60
tcgtattaaa agtttctact tccttgtaga atatctacat ccaatgggcc atggcacaaa	120
atttaagtct agaaagaatc ttaaaggctc atcttatagt aaccagaggc agg	173

<210> 143

<211> 511

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(511)

<223> n = A,T,C or G

<400> 143

cctcgtcaga ggggtggttc ctggtnacct gtactccacg gacctcggtg aagcaaaagc	60
ttcagggcag agggaatgag gcaaccaggt ggcagccccg ctgggccccg tggctcctgc	120
tctcctattg gacgtagagg caggggagag acttctctat acaaattatc tcatcacaga	180
agggatgata cttgctgctc tgccgtaggg tttttgatgc tgagctatgc tgcacatgac	240
gttaacctaa agaacttga ctgagctttt aaaaaaggac agcaaacaat tttataatcc	300
ttaaagtgtg atagacggtt acactagtgc aggggtattg ggaggctctt tgggtgtgga	360
ggctgtcact tgtatttatt gtgactctaa atctttgata gtaaaacaaa tgtaaaaaga	420
aatgtttgcc accagatggg aatagaagtt ccaataagca ggctggaatg ggtggctata	480
cgttgtatca cgaggaagtt ttagactctg a	511

<210> 144

<211> 190

<212> DNA

<213> Homo sapien

<400> 144

cattcttctg tcacatgcc attcagttgt caatcccatt gtctatgctt accggaaccg	60
agacttccgc tacacttttc acaaaattat ctccaggtat cttctctgcc aagcagatgt	120
caagagtggg aatggtcagg ctggggtaca gcctgctctc ggtgtgggcc tatgatctag	180
gtctctgcct	190

<210> 145

<211> 169

<212> DNA

<213> Homo sapien

<400> 145

gatgtgggta tctcctcaga tggccagttt gccctctcag gctcctggga tggaaccctg	60
cgcctctggg atctcacaaac gggcaccacc acgaggcgat ttgtgggcca taccaaggat	120
gtgctgagtg tggccttctc ctctgacaac cggcagattg tctctggat	169

<210> 146

<211> 511

<212> DNA

<213> Homo sapien

<400> 146
 atctagagaa gatttgggaa acacatgata gctatgggta aatacttaac agggcaatca 60
 caggaagat gactagattt cctaaccatcc atgagtgaag tttatagaag tatactctct 120
 gacttgatat aaaggaagat tttaaaaaac atgactgttc aggagtgttc aagtagggtc 180
 agatgaccag tgattgggaa tacttcgtaa gcaggagcaa gtaagatctg agccactgtt 240
 ctatcggtag ggtgtctgtg gtattccttg gtcaaagaag tactctaagc aacttcagtc 300
 tcacgaatta ctatcaccct cgtgggcata catgatgggt accctaaga ggaagtttca 360
 gaaggcagta atattggatc ctggaatagt cagacaggag cttcatgca gatacccttt 420
 tcagttctcc atacacccat tcacaagtgg tcacaaaaac acccagtacc tttacttggc 480
 tttaccact taacaatatg ctcaatatga g 511

<210> 147

<211> 421

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(421)

<223> n = A,T,C or G

<400> 147
 gaccagttga gttcttcctg gctattgtat aatccacagc cacactgtga aagcaaactc 60
 ggccagttag caacacaggg agaactctgc tgaactgacc aaagggtgcc atacttcagc 120
 tcagttagaa tttcacctcc atcatgttct aaagagccaa caacagattc tagggcactg 180
 caaatgctt cagcaattaa ttgaagttct gtttgagtac attcatcatc tttgagaatg 240
 ctttctgggt cggtgtgagt cttgtgtctg atatatgcag ccaaatgagt ttcagtacag 300
 ccacctcca acaaagccca tgggttcctg agtggttaact gcaggacatg cagtgccgtc 360
 tgacacgtga gcttcagctc atcccangca gtgtcatttc tgttgcagag aagccaagct 420
 g 421

<210> 148

<211> 237

<212> DNA

<213> Homo sapien

<400> 148
 acacaccact gttggccttc catctggggt aagtcaactg tgagttagaaa ccgaagataa 60
 cagttttgta ttcataatgg ctttttcata ctccaagtac ttttgagcac agagcctctt 120
 gcttctgacc tggcacttgg aacacagata tatatatctt ttgttctgtc cctgggaaac 180
 tgatatttgt gtaagacaac caccagatat tttctctaata aaaatcttct aaaatta 237

<210> 149

<211> 168

<212> DNA

<213> Homo sapien

<400> 149
 agagaaagt aaagtgcaat aatgtttgaa gacaataagt ggtgggtgat cttgtttcta 60
 ataagataaa cttttttgtc tttgttttat cttattaggg agttgtatgt cagtgtataa 120
 aacatactgt gtggtataac aggcctaata aattctttaa aaggagag 168

<210> 150

<211> 68

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(68)

<223> n = A,T,C or G

<400> 150

gggtggggttt ggcagagatg antttaagtg ctgtggccag aagcgggggg ggggttttgt	60
ggaaattt	68

<210> 151

<211> 421

<212> DNA

<213> Homo sapien

<400> 151

aggtgacacg tattcgggat gaaagtataa tagtcattcc ttcaaccctt gcattttatgg	60
actctggaaa tcgaagatcc acagttagta aagatgttcg tccaaagaca aaaaatagaa	120
acagctcaac aaagcgagag acaaaaaaac aaaatggcac tgtggctctg cctttgaagt	180
ctgggctcca gcagagggt gatcttcca caggagacga gacggcctat gacactctcc	240
agaactgttg tcagtgccga attttacttc ccttgcccat tctaaatgag caccaggaga	300
agtgccagag gttagctcac caaaagaaac tccagtgggg ctggtgagat ggctcagcgg	360
gtaagagcac ccgactgctc ttccgaaggt ccggagttca aatcccagca accacatggg	420
g	421

<210> 152

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 152

gaattcggca cnagctcgtg ccgccagggt nggtcctttt ttgtctccgc ctgccanga	60
cttcctacag ctatgccag tcgtcgcca cgtctcctt cngaggcctg ggcggcggt	120
ccgtgcgttn tgggccgggg gtgcctttc nctcncccag cattcacggg ggctccggcg	180
gccgcggcgt atccgtgtcc tccgccgct ntgtgtctc gtcctcctcn ggggcctacg	240
gctngctgct acngcggtt cctgaccgt tccnacgggc tgctggcngg caacgagaag	300
ctaaccatgc agaacctnaa cnaccgcctg gcctcctacc tgnacaaggt gcgcncctg	360
taggcggcca acggcnagct agaggtgaag atccnctact gggtagcaga agcagggggc	420
tgggccctgc ccgactacag ccactnctnc acnaccatgc agtacctgcn ggganaagat	480
tntngggngc caccatngag aactgca	507

<210> 153

<211> 513

<212> DNA

<213> Homo sapien

<400> 153

gaattcggca cgaggtggct cagatgtcca ctactgggag tatggctgaa ttgggaattt	60
tattgtgaaa aagcccatgg tgctgggaca tgaagcttcg ggaacagtcg aaaaagtggg	120

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atcatcggtta aagcacctaa aaccagggtga tcgtgttgcc atcgagcctg gtgctccccg      180
agaaaatgat gaattctgca agatgggccc atacaatctg tcaccttcca tcttcttctg      240
tgccgcgccc cccgatgacg ggaacctctg ccggttctat aagcacaatg cagccttttg      300
ttacaagctt cctgacaatg tcacctttga ggaaggcgcc ctgatcgagc cactttctgt      360
ggggatccat gcctgcagga gaggcggagt taccctggga cacaagggtc ttgtgtgtgg      420
agctgggcca atcgggatgg tcactttgct cgtggccaaa gcaatgggag cagctcaagt      480
agtggtgact gatctgtctg ctaccgatt gtc                                          513

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<210> 154

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 154

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ggcacgagct cgtgccgaat tcggcncgag cagacacaat ggtaagaatg gtgcctgtcc      60
tgctgtctct gctgctgctt ctgggtcctg ctgtcccca ggagaaccaa gatggtcgtt      120
actctctgac ctatatctac actgggctgt ccaagcatgt tgaagacgtc cccgcgtttc      180
aggcccttgg ctactcaat gacctccagt tctttagata caacagttaa gacaggaagt      240
ctcagcccat gggactctgg agacagggtg aaggaatgga ggattggaag caggacagcc      300
aacttcagaa ggccagggag gacatcttta tggagacctt gaaagacatc gtggagtatt      360
acaacgacag taacgggtct cacgtattgc agggaaggtt tggttgtgag atcgagaata      420
acagaagcag cggagcattc tggaatat attatgatgg aaaggactac attgaattca      480
acaaagaaat cccagcctgg gtcccct                                          507

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<210> 155

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 155

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ggcacgagga gacctaaagg ctgagtntcg ggaacaggag aaagctctgt tggccctcca      60
gcagcagtgt gctgagcagg cacaggagca tgaggtggag accagggccc tgcaggacag      120
ctggctgcag gcccaggcag tgctcaagga acgggaccag gagctggaag ctctgcgggc      180
agaaagtcag tcctcccggc atcaggagga ggctgcccgg gcccgggctg aggctctgca      240
ggaggccctt ggcaaggctc atgctgccct gcaggggaaa gagcagcatc tcctcgagca      300
ggcagaattg agccgcagtc tggaggccag cactgcaacc ctgcaagcct ccctggatgc      360
ctgccaggca cacagtcggc agctggagga ggctctgagg atacaagaag gtgagatcca      420
ggaccaggat ctccgatacc aggaggatgt gcagcagctg cagcaggcac ttgccagag      480
ggatgaagag ctgagacatc agcagga                                          507

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<210> 156

<211> 509

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(509)

<223> n = A,T,C or G

<400> 156

ggcacgagga	cagagagaac	cctgtngaaa	gagcgttacc	aggaggtcct	ggacaaacag	60
aggcaagtgg	agaatcagct	ccaagtgcaa	ttaaagcagc	ttcagcaaag	gagagaagag	120
gaaatgaaga	atcaccagga	gatattaaag	gctattcagg	atgtgacaat	aaagcgggaa	180
gaaacaaaga	agaagataga	gaaagagaag	aaggagtttt	tgcagaagga	gcaggatctg	240
aaagctgaaa	ttgagaagct	ttgtgagaag	ggcagaagag	aggtgtggga	aatggaactg	300
gatagactca	agaatcagga	tggcgaaata	aataggaaca	ttatggaaga	gactgaacgg	360
gcctggaagg	cagagatctt	atcactagag	agccggaaag	agttactggg	actgaaacta	420
gaagaagcag	aaaaagaggc	agaattgcac	cttacttacc	tcaagtcaac	tcccccaaca	480
ctggagacag	ttcgttccaa	acaggagtg				509

<210> 157

<211> 507

<212> DNA

<213> Homo sapien

<400> 157

ggcacgaggg	cagccctcct	accggcgcac	gtgggtgccg	cgctgctgac	tcccgtctgc	60
cctgaaccca	gtgcctgcag	ccatggctcc	cggccagctc	gccttattta	gtgtctctga	120
caaaaccggc	cttgtggaat	ttgcaagaaa	cctgaccgct	cttggtttga	atctggtcgc	180
ttccggaggg	actgcaaaaag	ctctcagggg	tgtctggtctg	gcagtcagag	atgtctctga	240
gttgacggga	tttcctgaaa	tgttgggggg	acgtgtgaaa	actttgcac	ctgcagtcca	300
tgtctggaatc	ctagctcgta	atattccaga	agataatgct	gacatggcca	gacttgattt	360
caatcttata	agagttgttg	cctgcaatct	ctatcccttt	gtaaagacag	tggcttctcc	420
aggtgtaagt	gttgaggagg	ctgtggagca	aattgacatt	gggtggagtaa	ccttactgag	480
agctgcagcc	aaaaaccacg	ctcgagt				507

<210> 158

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 158

ggcacgagtc	gagctgtgcc	tattcngntc	aatccaagag	tgagtaatgt	gaagtctgtc	60
tacaaaaccc	acattgatgt	cattcattat	cggaaaacgg	atgcaaaacg	tctgcatggc	120
cttgatgaag	aagcagaaca	gaaacttttt	tcagagaaac	gtgtggaatt	gcttaaggaa	180
ctttccagga	aaccagacat	ttatgagagg	cttgcttcag	ccttggtctc	aagcatttat	240
gaacatgaag	atataaagaa	gggaattttg	cttcagctct	ttggcgggac	aaggaaggat	300
tttagtcaca	ctggaagggg	caaatttcgg	gctgagatca	acatcttgct	gtgtggcgac	360
cctgggtacca	gcaagtccca	gctgctgcag	tacgtgtaca	acctcgctcc	cagggggccag	420
tacacgtntg	ggaaggggctc	cagtgcannnt	ggcctnactg	cntacgtaat	gaaagaccct	480
gagacaaggn	anctggnnct	gnnacag				507

<210> 159

<211> 508

<212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(508)
 <223> n = A,T,C or G

<400> 159

ggcacnanaa accaggatta tggtnnggat ccaaagattg ctaatgcaat aatgaaggca	60
gcagatgagg tagctgaagg taaattaaat gatcattttc ctctcgtggt atggcagact	120
ggatcaggaa ctcagacaaa tatgaatgta aatgaagtca ttagcaatag agcaattgaa	180
atgttaggag gtgaacttgg cagcaagata cctgtgcac ccaacgatca tgtaataaaa	240
agccagagct caaatgatac ttttcccaca gcaatgcaca ttgctgctgc aatagaagtt	300
catgaagtac tgttaccagg actacagaag ttacatgatg ctcttgatgc aaaatccaaa	360
gagtttgac agatcatcaa gattggacgt actcactc aggatgctgt tccacttact	420
cttgggcagg aatttagtgg ttatgttcaa caagtaaaat atgcaatgac aagaataaaa	480
gctgccatgc caagaatcta tgagctcg	508

<210> 160
 <211> 508
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(508)
 <223> n = A,T,C or G

<400> 160

ggcacgagct tggagcaaag tcactctnaag gaattagagg acacacttca ggtaggcac	60
atacaagagt ttgagaaggt tatgacagac cacagagttt ctttgaggga attaaaaaag	120
gaaaaccaac aaataattaa tcaaatacaa gaatctcatg ctgaaattat ccaggaaaaa	180
gaaaaacagt tacaggaatt aaaactcaag gtttctgatt tgtcagacac gagatgcaag	240
ttagagggtt aacttgcgtt gaaggaagca gaaactgatg aaataaaaat tttgctggaa	300
gaaagcagag cccagcagaa ggagaccttg aaatctcttc ttgaacaaga gacagaaaat	360
ttgagaacag aaattagtaa actcaaccaa aagattcagg ataataatga aaattatcag	420
gtgggcttag cagagctaag aactttaatg acaattgaaa aagatcagtg tatttccgag	480
ttaattagta gacatgaaga agaactcta	508

<210> 161
 <211> 507
 <212> DNA
 <213> Homo sapien

<400> 161

ggcacgagcg ctaccggcgc ctccctctgcg gccactgagc cggagccggc ctgagcagcg	60
ctctcggttg cagtaccac tggaggact taggcgctcg cgtggacacc gcaagcccct	120
cagtagcttc ggcccaagag gcctgcttcc cactcgctag ccccgccggg ggtccgtgtc	180
ctgtctcggg ggccggaccc gggcccagac ccgagcagta gccggcgcca tgtcgggtgt	240
gggcatagac ctgggcttcc agagctgcta cgtcgctgtg gcccgcgccg gcggcatcga	300
gactatcgct aatgagtata gcgaccgctg cacgcccggc tgcatctctt ttggtcctaa	360
gaatcggtta attggagcag cagctaaaag ccaggtaatt tctaattgcaa agaacacagt	420
ccaaggattt aaaagattcc atggccgagc attctctgat ccatttgtgg aggcagaaaa	480
atctaaccctt gcatatgata ttgtgca	507

<210> 162
 <211> 507
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(507)
 <223> n = A,T,C or G

<400> 162
 ggcacgagca gctgtgcacc gacatgntct cagtgtcctg agtaagacca aagaagctgg 60
 caagatcctc tctaataatc ccagcaaggg actggccctg ggaattgccca aagcctggga 120
 gctctacggc tcacccaaty cctctggtgct actgattgct caagagaagg aaagaaacat 180
 atttgaccag cgtgccatag agaatgagct actggccagg aacatccatg tgatccgacg 240
 aacatttgaa gatattctctg aaaaggggtc tctggaccaa gaccgaaggc tgtttgtgga 300
 tggccaggaa attgctgtgg ttacttccg ggatggctac atgcctcgtc agtacagtct 360
 acagaattgg gaagcacgtc tactgctgga gaggtcacat gctgccaaagt gccagacat 420
 tgccaccag ctggctggga ctaagaaggt gcagcaggag ctaagcaggc cgggcatgct 480
 ggagatgttg ctccttgcc agcctga 507

<210> 163
 <211> 460
 <212> DNA
 <213> Homo sapien

<400> 163
 ggcacgagaa ataactttat ttcattgtgg gtcgcggttc ttgtttgtgg atcgtgtga 60
 tcgtcacttg acaatgcaga tcttcgtgaa gactctgact ggtaagacca tcaccctcga 120
 gggttgagccc agtgacacca tcgagaatgt caaggcaaag atccaagata aggaaggcat 180
 cctcctgac cagcagaggc tgatctttgc tggaaaacag ctggaagatg ggcgcaccct 240
 gtctgactac aacatccaga aagagtccac cctgcacctg gtgctccgtc tcagaggtgg 300
 gatgcaaadc ttcgtgaaga cactcactgg caagaccatc acccttgagg tggagcccag 360
 tgacaccatc gagaacgtca aagcaaagat ccaggacaag gaaggcattc ctctgacca 420
 gcagagggtg atctttgccg gaaagcagct ggaagatggg 460

<210> 164
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 164
 ggcacgagcc ggatctcatt gccacgcgcc cccgacgacc gcccgcgtg cattcccgat 60
 tcccttttgg tccaagtcca atatggcaac tctaaaggat cagctgattt ataactctct 120
 aaaggaagaa cagaccccc agaataagat tacagttgtt ggggttggtg ctgttgatgt 180
 ggcctgtgcc atcagtatct taatgaagga cttggcagat gaacttgctc ttgttgatgt 240
 catcgaagac aaattgaagg gagagatgat ggatctccaa catggcagcc ttttccttag 300
 aacaccaaag attgtctctg gcaaagacta taatgtaact gcaaactcca agctggatcat 360
 tatcacggct ggggcacgtc agcaagaggg agaaagccgt cttaatttgg tccagcgtaa 420
 cgtgaacatc tttaaattca tcattcctaa tgtgtgaaaa ta 462

<210> 165
 <211> 462
 <212> DNA

<213> Homo sapien

<400> 165

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ggcacgagga agccatgagc agcaaagtct ctcgcgacac cctgtacgag gcggtgcggg      60
aagtcctgca cggaaccag cgcaagcgcc gcaagttcct ggagacggtg gagttgcaga      120
tcagcttgaa gaactatgat cccagaagg acaagcgctt ctcgggcacc gtcaggctta      180
agtcactcc ccgccctaag ttctctgtgt gtgtcctggg ggaccagcag cactgtgacg      240
aggctaaggc cgtggatata cccacatgg acatcgaggc gctgaaaaaa ctcaacaaga      300
ataaaaaact ggtcaagaag ctggccaaga agtatgatgc gtttttggcc tcagagtctc      360
tgatcaagca gattccacga atcctcggcc caggtttaaa taaggcagga aagttccctt      420
ccctgtctac acacaacgaa aacatggtgg ccaaagtgga tg                          462

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<210> 166

<211> 459

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(459)

<223> n = A,T,C or G

<400> 166

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ggcacgagag ggacctgtnt gaatggntcc actagggtn anntgnctct tacttttaac      60
cantnaaatn gacctgcccg tgaanangcg ggcntgacac annaanacga gaagacccta      120
tggagcttta atttattaat gcanacagna cctaacaac ccacangtcc taaactacca      180
agcctgcatt aaaaatttcg gntggggcna cctcnnagca naaccaacc tccgagcaac      240
tcatgctaag acttcaccag tcaaagctga actactatac tcaattgatc caataacttg      300
accaacagan caagntaccc tagggataac ancacaatcc tattctagac cccttatnac      360
caatangntt tacacctcna tngnggaacc aggacatccg atggggcagn cgttattaaa      420
gttngttgnt aacnataaag tctacgtgat ctgagttag                          459

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<210> 167

<211> 464

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(464)

<223> n = A,T,C or G

<400> 167

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gaattgggac caacganaan cntgcggntc ttnttttgcn tccanngccc agctnattgc      60
tcagacacac atggggaagg tnaaggtcgg gagtcaacng atttggtngt attgnagcgt      120
ttgggtacca gngctgcttt taactctggn aaagtggata ttgttgtcat naatgacccc      180
tncattgacc tnaactacat ggtttacatg ttccaatatg attccacca tggcaaattc      240
catngcaccg tnaaggctga gaacgggaag cttgtnatca atggaaatcc catcaccatc      300
tttcangaac ganatccntn caaaaatcaa anttgggggc gatgcttggc cnettgaagt      360
accgttcaan gggaannncc ccactttggc cgntntttnc aancccaccc caatttgggn      420
aaaaaaaaag gggnnnttgg gggggggcct tttannnttt tttt                          464

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<210> 168

<211> 462

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(462)

<223> n = A,T,C or G

<400> 168

ggcacgaggn	nnaacctncc	gggctggggc	agcacgcctt	gngcaancct	gcactgcact	60
gaagacccgg	tgccggaagc	cgngggcngc	nacatgcagn	aactgaacca	gctggggcgcg	120
cancagttct	cagacctgac	agaggtgctt	ttacacttcc	taactgatcc	anantangtg	180
gaaatattnt	tngttnatnt	catntgaatn	atccancncc	aatcatanca	nntttnattn	240
cctcataanc	nttgagaana	gcnnccctnt	gnttncanan	ggtgctntga	anangagtct	300
cacangcaan	caggctccaag	cggatttntt	aactntgggt	cttantgang	agaaagncac	360
ttacttttct	gaaancngga	agcagaatgc	tcccacccct	gctcgaatgg	ccatacgtca	420
agactctgat	gattaaccag	ctttanatat	ggacnggaaa	tt		462

<210> 169

<211> 460

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(460)

<223> n = A,T,C or G

<400> 169

ggcacgaggg	acagcagacn	agacagtcac	agcagccttg	acaaaacgtt	cctggaactc	60
aagntcttnt	ncncaaagga	ggacagagca	nacagcagag	accatggant	ctncctcggc	120
ccctccccac	agatgggtgca	tccccgggca	naggctcctg	ctcacagcct	cacttctaac	180
cttctggaac	ccgcccacca	ctgccaagct	cactattgaa	tccacgccgt	tcaatgnntc	240
ntaggggaag	gaggngcttt	ctactnttnc	acaatctgan	ccccttcttn	tttggttact	300
ancatggctc	tncatgtnaa	aatactggna	tggntaacct	gtcaaattta	taggnantnt	360
gctaattggg	aaactnccnn	tngtctaccc	caggggnccc	agattcctnn	gttcncataa	420
cnattaattt	aaccctaat	gncaanccct	tngttaaaga			460

<210> 170

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 170

ggcacgaggg	ggatttttag	gtggtcnggt	gtggatcag	gaataatgtg	ggaggccaga	60
ttgaagtcca	ggccaggaac	aatggtaatt	gtgggactta	agaaagtgtg	agtacagctg	120
aatgagccgg	ggagcagaaa	gtatatgcgt	caggtatgag	gaagaaaata	gattttggaa	180
gttatgagaa	atgtagagag	tgagttgagc	atagtttgtg	attttgaggg	cctctaacag	240
tattaaagca	gcggcagcgg	ctgcacacag	acatgatggc	taggctaaaa	caggaaggtc	300
aagttgtttg	gacagaaagg	ctacagggtg	cagtcctggc	tcttgtgtaa	gaattctgac	360
cacactaacc	atgcctagga	aggaaaggag	ttgttctttt	gtaagggatt	gaggtttggg	420

agattaatcg gacacgatca gcagggagag cacctgtgtt tttatgagaa ttatgctgag 480
ataggttaaca gatgaggatg aaatttgg 508

<210> 171

<211> 507

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 171

ggcagagagac cagccactag cgcagctcgc agcgatggcc tatgtccccc caccgggcta 60
ccagcccacc tacaaccgga cgctgcctta ctaccagccc atcccgggcg ggctcaacgt 120
gggaatgtct gtttacatcc aaggagtggc cagcgagcac atgaagcggg tcttcgtgaa 180
ctttgtgggt gggcaggatc cgggctcaga cgtcgccttc cacttcaatc cgcggtttga 240
cggctgggac aaggtggtct tcaacacgtt gcagggcgcg aagtggggca gcgaggagag 300
gaagaggagc atgcccttca aaaaggggtc cgcctttgag ctggtcttca tagtcctggc 360
tgagcactac aaggtggtgg taaatggaaa tcccttctat gagtacgggc accggcttcc 420
cctacagatg gtcacccacc tgcaagtgga tggggatctg caacttcaat caatcaactt 480
catcggaggc cagcccctcc ggcccca 507

<210> 172

<211> 409

<212> DNA

<213> Homo sapien

<400> 172

ggcagagact ggagtgtctg ctgccacccc ctcgctcctc gcagaaatgt ctgtcaccta 60
cgatgactct gtgggagtgg aagtgtccag cgacagcttc tgggaggttg ggaactacaa 120
acggactgtg aagcggattg acgatggcca cgcctgtgtt ggtgacctca tgaactgtct 180
gcatgagcgg gcacgcatcg agaaggcgtg tgcacagcag ctactgagt gggcccgcag 240
ctggaggcag ctggtagaga agggaccaca gtatgggacc gtggagaagg cctggatagc 300
tgtcatgtct gaagcagaga gggtagtgga actgcacctg gaagtgaagg catcactgat 360
gaatgaagac tttgagaaga tcaagaactg gcagaaggaa gcctttcac 409

<210> 173

<211> 409

<212> DNA

<213> Homo sapien

<400> 173

ggcagagagg cagctagagg aagagtccaa ggccaagaac gcactggccc acgccctgca 60
gtcagctcgc catgactgtg acctgctgcg ggaacagtat gaagaggagc aggaagccaa 120
ggctgagctg cagaggggcca tgtccaaggc caacagcgag gtagcccagt ggaggacgaa 180
atatgagacg gatgccatcc agcgacaga ggagctggaa gaggccaaga agaagctggc 240
tcagcgtctg caggatgctg aggaacatgt agaagctgtg aattccaaat gcgcttctct 300
tgaaaagacg aagcagcgac ttcagaatga agtggaggac ctcatgattg acgtggagag 360
gtctaattgt gcctgcgctg cgcttgataa gaagcagagg aactttgac 409

<210> 174

<211> 407

<212> DNA

<213> Homo sapien

<400> 174

ggcacgagcc	ggggcggggc	gcggcgctcc	ggctcgaggc	attcgagact	gcgggagccg	60
ggctggcagg	agcaggatgg	cggcgcgggc	ggctgcaggc	gaggcgccgc	gggtgctggt	120
gtacggcggc	aggggcgctc	tgggttctcg	atgcgtgcag	gcttttcggg	cccgcgaactg	180
gtgggttgcc	agcgttgatg	tgggtggagaa	tgaagaggcc	agcgctagca	tcattgttaa	240
aatgacagac	tcgttcaactg	agcaggctga	ccagggtgact	gctgagggtt	gaaagctctt	300
gggtgaagag	aagggtggatg	caattctttg	cggtgctgga	ggatggggccg	ggggcaatgc	360
caaatccaag	tctctcttta	agaactgtga	cctgatgtgg	aagcaga		407

<210> 175

<211> 407

<212> DNA

<213> Homo sapien

<400> 175

ggcacgagct	tgcccgtcgg	tcgctagctc	gctcgggtgcg	cgctcgtccc	ctccatggcg	60
ctcttcgtgc	ggctgctggc	tctcgccctg	gctctggccc	tgggccccgc	cgcgaccctg	120
gcgggtccc	ccaagtcgcc	ctaccagctg	gtgctgcagc	acagcaggct	ccggggccgc	180
cagcacggcc	ccaacgtgtg	tgctgtgcag	aagggtattg	gcactaatag	gaagtacttc	240
accaactgca	agcagtggtg	ccaaaggaaa	atctgtggca	aatcaacagt	catcagctac	300
gagtgtgtgc	ctggatatga	aaaggtcctt	ggggagaagg	gctgtccagc	agccctacca	360
ctctcaaacc	tttacgagac	cctgggagtc	gttggatcca	ccaccac		407

<210> 176

<211> 409

<212> DNA

<213> Homo sapien

<400> 176

ggcacgagtg	gtgccaaaac	gggaccatgc	cctcctggag	gagcagagca	agcagcagtc	60
caacgagcac	ctgcgccgcc	agttcgccag	ccaggccaat	gttgtggggc	cctggatcca	120
gaccaagatg	gaggagatcg	ggcgcattctc	cattgagatg	aacgggaccc	tggaggacca	180
gctgagccac	ctgaagcagt	atgaacgcag	catcgtggac	tacaagcccc	acctggacct	240
gctggagcag	cagcaccagc	tcatccagga	ggccctcatc	ttcgacaaca	agcacaccaa	300
ctataccatg	gagcacatcc	gcgtgggctg	ggagcagctg	ctcaccacca	ttgcccgcac	360
catcaacgag	gtggagaacc	agatcctcac	ccgcgacgcc	aagggcac		409

<210> 177

<211> 408

<212> DNA

<213> Homo sapien

<400> 177

ggcacgaggt	ccaggtaact	gcaaaaacaa	tggctcagca	tgaagaactg	atgaagaaaa	60
ctgaaacaat	gaatgtagtt	atggagacca	ataaaatgct	aagagaagag	aaggagcagg	120
tttcaaaaat	ggcatcagtc	cgtcagcatt	tggaagaaac	aacacagaaa	gcagaatcac	180
agttgttggg	gtgtaaagca	tcttgggagg	aaagagagag	aatgttaaag	gatgaagttt	240
ccaaatgtgt	atgtcgctgt	gaagatctgg	agaaacaaaa	cagattactt	catgatcaga	300
tcgaaaaaatt	aagtgacaag	gtcgttgcc	ctgtgaagga	aggtgtacaa	gttccactga	360
atgtatctct	cagtgaagaa	ggaaaatctc	aagaacaaat	tttgga		408

<210> 178

<211> 92

<212> DNA

<213> Homo sapien

<400> 178

ggcacgagaa gaaattaaga gctaaagaca aggagaatga aaatatgggt gcaaagctga	60
acaaaaaagt taaagagcta gaagaggaga tg	92

<210> 179

<211> 411

<212> DNA

<213> Homo sapien

<400> 179

ggcacgagga gacacgccac ctataccaca gttctcagaa tgaattagct aagttggaat	60
cagaacttaa gactctcaaa gaccagttga ctgatttaag taactcttta gaaaaatgta	120
aggaacaaaa aggaaacttg gaaggatca taaggcagca agaggctgat attcaaaatt	180
ctaagttcag ttatgaacaa ctggagactg atcttcaggc ctccagagaa ctgaccagta	240
ggctgcatga agaataaat atgaaagagc aaaagattat aagcctgctt tctggcaagg	300
aagaggcaat ccaagtagct attgctgaac tgcgtcagca acatgataaa gaaattaaag	360
agctggaaaa cctgctgtcc caggaggaag aggagaatat tgttttagaa g	411

<210> 180

<211> 411

<212> DNA

<213> Homo sapien

<400> 180

ggcacgaggt tgttcgagac gggcgagcgg agttagcagg gctttactgc agagcgcgcc	60
gggcactcca gcgaccgtgg ggatcagcgt aggtgagctg tggccttttg cgaggtgctg	120
cagccatagc tacgtgcgtt cgctacgagg attgagcgtc tccaccatc ttctgtgctt	180
caccatctac ataataaatc ccagtatgaa gcagaaacaa gaagaaatca aagagaatat	240
aaagactagt tctgtcccaa gaagaactct gaagatgatt cagccttctg catctggatc	300
tcttggttga agagaaaatg agctgtccgc aggtctgtcc aaaaggaaac atcggaatga	360
ccacttaaca tctacaactt ccagccctgg ggttattgtc ccagaatcta g	411

<210> 181

<211> 411

<212> DNA

<213> Homo sapien

<400> 181

ggcacgaggc gggacagggc gaagcggcct gcgcccacgg agcgcgcgac actgcccgga	60
agggaccgcc acccttgccc cctcagctgc ccactcgtga tttccagcgg cctccgcgcg	120
cgcacgatgc cctcggccac cagccacagc gggagcggca gcaagtcgtc cggaccgcca	180
ccgcgcgcgg gttcctccgg gactgagggc gccgcgggag ccggggccgc cgcgcgggct	240
tctcagcacc ccgcaaccgg caccggcgct gtccagaccg aggccatgaa gcagattctc	300
ggggtgatcg acaagaaact tcggaacctg gagaagaaaa agggtaagct tgatgattac	360
caggaacgaa tgaacaaagg ggaaaggcct aatcaagatc agctggatgc c	411

<210> 182

<211> 411

<212> DNA

<213> Homo sapien

<400> 182

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ggcacgagcc gacatggagc tgttcctcgc gggccgcccgc gtgctgggtca ccggggcagg      60
caaaggtata gggcgccgca cgggtccaggc gctgcacgcg acgggcgcgc ggggtgggtggc      120
tgtgagcccg actcaggcgg atcttgacag ccttgctccg gagtgcccgg ggatagaacc      180
cgtgtgcgtg gacctgggtg actgggaggc caccgagcgg gcgctgggca gcgtggggccc      240
cgtggacctg ctggtgaaca acgcccgtgt cgcctgtctg cagcccttcc tggaggtcac      300
caaggaggcc tttgacagat cctttgaggt gaacctgcgt gcggtcatcc aggtgtcgca      360
gattgtggcc aggggcttaa tagcccgggg agtcccaggg gccatcgtga a              411

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<210> 183

<211> 409

<212> DNA

<213> Homo sapien

<400> 183

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ggcacgagcc tacactctgg ccagagatac cacagtcaaa cctggagcca aaaaggacac      60
aaaggactct cgacccaaac tgcccagac cctctccaga ggttgggggtg accaactcat      120
ctggactcag acatatgaag aagctctata taaatccaag acaagcaaca aacccttgat      180
gattattcat cacttggtat agtgcccaca cagtcaagct ttaaagaaaag tgtttgctga      240
aaataaagaa atccagaaat tggcagagca gtttgcctc ctcaatctgg tttatgaaac      300
aactgacaaa cacctttctc ctgatggcca gtatgtccc aggattatgt ttgtcgacc      360
atctctgaca gttagagccg atatcactgg aagatattca aatcgtctc              409

```

<210> 184

<211> 410

<212> DNA

<213> Homo sapien

<400> 184

```

ggcacgaggt cattccagca ccaacaggat ccaagccaga ttgattgggc tgcattggcc      60
caagcttgga ttgccc aaag agaagcttca ggacagcaaa gcatggtaga acaaccacca      120
ggaatgatgc caaatggaca agatatgtct acaatggaat ctgggtccaa caatcatggg      180
aatttccaag gggattcaaa cttcaacaga atgtggcaac cagaatgggg aatgcatcag      240
caacccccac acccccctcc agatcagcca tggatgccac caacaccagg cccaatggac      300
attgttcctc cttctgaaga cagcaacagt caggacagtg ggggaatttg ccctgacaac      360
aggcatatat ttaaccagaa caatcacaa cttgtgtggac caccgataa              410

```

<210> 185

<211> 411

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (411)

<223> n = A,T,C or G

<400> 185

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ggcacgagca cagatgtagt tttctctgcg cgtgtgcgtt ttccctcctc ccccgccctc      60
aggggtccacg gccaccatgg cgtattaggg gcagcagtg ctcgggcagc attggccttt      120
gcagcggcgg cagcagcacc aggtctctgca gcggcaaccc ccagcggcct aagccatggc      180
gcttctcacg gcattcagca gcagcgttgc tgaaccgac aaagacacct tcgaattaag      240
cacattcctc gattccagca aagcaccgca acatgaccga aatgagcttc ctgagcagcg      300
aggtgttggt gggggacttg atgtccccct tcgacccgtc ggggtttggg gctgaagaaa      360
gcctangtct cttagatgat tacctggagg tgccaagca cttcaaacct c              411

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<210> 186
 <211> 410
 <212> DNA
 <213> Homo sapien

<400> 186
 ggcacgagct tctagtcccg ccatggccgc tctcaccggt gacccccagt tccagaagct 60
 gcagcaatgg taccgcgagc accgctccga gctgaacctg cgccgcctct tccgatgccaa 120
 caaggaccgc ttcaaccact tcagcttgac cctcaacacc aacctatggg atacctgtgt 180
 ggattactcc aagaacctgg tgacggagga cgtgatgcgg atgctgggtg acttggtcaa 240
 gtccaggggg gtggaggccg cccgggagcg gatgttcaat ggtgagaaga tcaactacac 300
 cgagggtcga gccgtgctgc acgtggctct gcggaaccgg tcaaacacac ccatcctggg 360
 agacggcaag gatgtgatgc cagaggtcaa caaggttctg gacaagatga 410

<210> 187
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 187
 ctttcgtggc tcaactccctt tcctctgctg ccgctcggtc acgcttgtgc ccgaaggagg 60
 aaacagtgc agacctggag actgcagttc tctatccttc acacagctct tccaccatgc 120
 ctggatcact tcttttgaat gcagaagctt gctggccaaa agatgtggga attgttgccc 180
 ttgagatcta ttttccttct caatatgttg atcaagcaga gttggaaaaa tatgatgggt 240
 tagatgctgg aaagtatacc attggcttgg gccaggccaa gatgggcttc tgcacagata 300
 gagaagatat taactctctt tgcagtactg tgggtcagaa tcttatggag agaaataacc 360
 tttcctatga ttgcattggg cggtcggaag ttggaacaga gacaatcatc gacaaatcaa 420
 agtctgtgaa gactaatgtg atgcagctgt ttgaagagtc tgggaatata gatatagaag 480
 gaatcgacac aactaatgca tgctat 506

<210> 188
 <211> 506
 <212> DNA
 <213> Homo sapien

<400> 188
 gccacagagg cggcggagag atggccttca gcggttccca ggctccctac ctgagtccag 60
 ctgtcccctt ttctgggact attcaaggag gtctccagga cggacttcag atcactgtca 120
 atgggaccgt tctcagctcc agtggaaaca gggttgctgt gaactttcag actggcttca 180
 gtggaaatga cattgccttc cacttcaacc ctccggttga agatggaggg tacgtggtgt 240
 gcaacacgag gcagaacgga agctgggggg ccgaggagag gaagacacac atgcctttcc 300
 agaaggggat gccctttgac ctctgcttcc tgggtcagag ctccagatttc aaggatgatg 360
 tgaacgggat cctcttcgtg cagtacttcc accgcgtgcc cttccaccgt gtggacacca 420
 tctccgtcaa tggctctgtg cagctgtcct acatcagctt ccagcctccc ggcgtgtggc 480
 ctgccaaacc ggctcccatt acccag 506

<210> 189
 <211> 399
 <212> DNA
 <213> Homo sapien

<400> 189
 ctggacagga gaagagcctg gctgctgaag gcagggtgga caccgaccag ggcagcattg 60
 ctggagcccc agaggatgaa agatcgcaga gcacagcccc ccaggcacca gagtgcttgc 120
 accctgccgg accggctggg ctctgtaggc cgacatctgg cctttcccag ggcccaggaa 180

aggaaacctt	ggaaagtgt	ctaategtct	tagactctga	aaaacccaag	aaacttctgt	240
tccacccaaa	gcagctgtac	ttctctgcca	ggcaggggtga	gctgcagaag	gtgcttctca	300
tgctggttga	tggaattgat	cccaacttca	aaatggagca	ccaaagtaag	cgttcccat	360
tacatgctgc	tgcggaggct	ggccacgtgg	acatctgcc			399

<210> 190
 <211> 401
 <212> DNA
 <213> Homo sapien

<400> 190						
cggcgacggg	ggtggtgact	gagcggagcc	cggtgacagg	atgttgggtgt	tggtattagg	60
agatctgcac	atcccacacc	ggtgcaacag	tttgccagct	aaattcaaaa	aactcctggg	120
gccaggaaaa	attcagcaca	ttctctgcac	aggaaacctt	tgcaccaaag	agagttatga	180
ctatctcaag	actctggctg	gtgatgttca	tattgtcaga	ggagacttcg	atgagaatct	240
gaattatcca	gaacagaaa	ttgtgactgt	tggacagttc	aaaattgggtc	tgatccatgg	300
acatcaagtt	attccatggg	gagatatggc	cagcttagcc	ctggttcaga	ggcaatttga	360
tgtggacatt	cttatctcgg	gacacacaca	caaatttgaa	g		401

<210> 191
 <211> 406
 <212> DNA
 <213> Homo sapien

<400> 191						
tggcagccta	agccgtggga	gggttccagt	cgagaatggg	aagatgaaag	acttcagatg	60
gaacagaaat	aatgcctttt	tttgacaaac	gcagcagtg	gtgcctctag	cttgcaagag	120
cgttactccc	cttcatagtc	ttaaaagggt	ttgcactgc	gtgcagttag	agtagctaaa	180
tcttgtgtga	cgctccacaa	acacttgtaa	gaattttgca	gagaaagata	accgttgcca	240
cccaatgccc	cccacaggca	ttctactccc	cagtacctct	taggggtggga	gaaatgggtga	300
agagttgttc	ctacaacttg	ctaaccctag	ggacagggta	gtagattagc	atcatccgga	360
tagatgtgaa	gaggacggct	gtttggataa	taattaagga	taaaat		406

<210> 192
 <211> 316
 <212> DNA
 <213> Homo sapien

<400> 192						
cccggggagg	ccctgggtcat	aaaactttta	attttactag	tgttacttaa	tgtatattct	60
aaaaagagaa	tgcagtaact	aatgccctaa	atgtttgatc	tctgtttgtc	attacttttt	120
caaaattatt	tttttctgta	aagtataata	tataaaactt	cttgcttaaa	ttgaatttct	180
atattagtgg	ttaattgcag	tttattaaag	ggatcattat	cagtaatttc	atagcaactg	240
ttctagtgtt	ttgtgttttt	aaaacagaat	taggaatttg	agatatctga	ttatattttt	300
catatgaatc	acagac					316

<210> 193
 <211> 146
 <212> DNA
 <213> Homo sapien

<400> 193						
gaaacatgga	ctgcccctta	aattttgact	gtcctaaaaa	cctatttctg	atttataata	60
tgctgcctga	taaagtgaca	ctagatgtac	cagctgagtg	tttaattctc	ccatcacaga	120
tcagatttga	gcattaacag	gtattt				146

<210> 194
 <211> 405
 <212> DNA
 <213> Homo sapien

<400> 194
 cggatgtgct cactgacatt ctactccaag tcggagatgc agatccactc caagtcacac 60
 accgagacca agccccacaa gtgccacat tgctccaaga ccttcgccaa cagctcctac 120
 ctggcccagc acatccgtat acactcaggg gctaagccct acagttgtaa cttctgtgag 180
 aaatccttcc gccagctctc ccaccttcag cagcacaccc gaatccacac tggatgata 240
 ccatacaaat gtgcacaccc aggctgtgag aaagccttca cacaactctc caatctgcag 300
 tcccacagac ggcaacacaa caaagataaa cccttcaagt gccacaactg tcatcgggag 360
 tacacggatg cagctcact agaggtgcac ctgtctacgc acaca 405

<210> 195
 <211> 421
 <212> DNA
 <213> Homo sapien

<400> 195
 agaattcggc acgagctact ccttcgcgcg tggcactccg cagcctttaa ggttcgcgcg 60
 ggggccaggc aagagttagc catgaagagc ctcaagtccc gcctgaggag gcaggacgtg 120
 cccggccccg cgtcgtctgg cggccgcgcc gccagcgcgc atgcagcaga ttggaataaa 180
 tatgatgacc gattgatgaa agcagcagaa aggggggatg tagaaaaagt gacgtcaatc 240
 cttgctaaaa aggggggtcaa tccaggcaaa ctagatytgg aaggcagatc tgtcttccat 300
 gttgtgacct caaaggggaa tcttgagtggt ttgaatgcca tccttataca tggagttgat 360
 attacaacca gtgacactgc agggagaaat gctcttcacc tggctgctaa gtatggacat 420
 g 421

<210> 196
 <211> 476
 <212> DNA
 <213> Homo sapien

<400> 196
 agaattgatc tatagattta atgcaatgcc tactaaaatc ccagtacgat tttttacagg 60
 catagacaat agacatagcc aaaacttatt ctaaaataca tatgaagatg cacaggccct 120
 agttatacaa tcttgacaaa gaagaataaa gtgggaagaa tctatttgat ttaaggctt 180
 accatgtaac tacagtcac aagagagtgt ggtatcggca gacggtcaga catacagatc 240
 aatggaatgt aacagaggac ccagaaatag gccacacag atatgctcaa tggatatttg 300
 acaagcgtgc aaaacaattc aatggaagaa taagctttca aaaaaatggc gttggagcaa 360
 ccggacatcc ataggaaaaa atgaacccat acctaaacca taaaccttat ataaaaataa 420
 acacaaaatg aatcataggc ttaaagttaa gctataaaac ttttagagaa aaacac 476

<210> 197
 <211> 503
 <212> DNA
 <213> Homo sapien

<400> 197
 tagccctcgg tgaagcccca gaccacagct atgagtcctt tcgtgtgacg tctgcgcaga 60
 aacatgttct gcatgtccag ctcaaccggc ccaacaagag gaatgccatg aacaaggctt 120
 tctggagaga gatggtagag tgcttcaaca agatttcgag agacgctgac tgcggggcgg 180
 tggatgctc tgggtgcagga aaaatgttca ctgcaggtat tgacctgatg gacatggctt 240

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cggacatcct gcagcccaaa ggagatgatg tggcccggat cagctggtac ctccgtgaca 300
tcatcactcg ataccaggag accttcaacg tcatcgagag gtgcccgaag cccgtgattg 360
ctgccgtcca tgggggctgc attggcggag gtgtggacct tgtcaccgcc tgtgacatcc 420
gggtactgtgc ccaggatgct ttcttcagg tgaaggaggt ggacgtgggt ttggctgccc 480
atgtaggaac actgcagcgc ctg 503

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<210> 198
<211> 168
<212> PRT
<213> Homo sapien

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```

<400> 198
Phe Val Ala His Ser Leu Ser Ser Ala Ala Arg Ser Arg Leu Cys
 1          5          10          15
Pro Lys Glu Glu Thr Val Thr Asp Leu Glu Thr Ala Val Leu Tyr Pro
 20          25          30
Ser His Ser Ser Phe Thr Met Pro Gly Ser Leu Pro Leu Asn Ala Glu
 35          40          45
Ala Cys Trp Pro Lys Asp Val Gly Ile Val Ala Leu Glu Ile Tyr Phe
 50          55          60
Pro Ser Gln Tyr Val Asp Gln Ala Glu Leu Glu Lys Tyr Asp Gly Val
 65          70          75          80
Asp Ala Gly Lys Tyr Thr Ile Gly Leu Gly Gln Ala Lys Met Gly Phe
 85          90          95
Cys Thr Asp Arg Glu Asp Ile Asn Ser Leu Cys Met Thr Val Val Gln
100          105          110
Asn Leu Met Glu Arg Asn Asn Leu Ser Tyr Asp Cys Ile Gly Arg Leu
115          120          125
Glu Val Gly Thr Glu Thr Ile Ile Asp Lys Ser Lys Ser Val Lys Thr
130          135          140
Asn Leu Met Gln Leu Phe Glu Glu Ser Gly Asn Thr Asp Ile Glu Gly
145          150          155          160
Ile Asp Thr Thr Asn Ala Cys Tyr
165

```

```

<210> 199
<211> 168
<212> PRT
<213> Homo sapien

```

```

<400> 199
His Arg Gly Gly Gly Glu Met Ala Phe Ser Gly Ser Gln Ala Pro Tyr
 1          5          10          15
Leu Ser Pro Ala Val Pro Phe Ser Gly Thr Ile Gln Gly Gly Leu Gln
 20          25          30
Asp Gly Leu Gln Ile Thr Val Asn Gly Thr Val Leu Ser Ser Ser Gly
 35          40          45
Thr Arg Phe Ala Val Asn Phe Gln Thr Gly Phe Ser Gly Asn Asp Ile
 50          55          60
Ala Phe His Phe Asn Pro Arg Phe Glu Asp Gly Gly Tyr Val Val Cys
 65          70          75          80
Asn Thr Arg Gln Asn Gly Ser Trp Gly Pro Glu Glu Arg Lys Thr His
 85          90          95
Met Pro Phe Gln Lys Gly Met Pro Phe Asp Leu Cys Phe Leu Val Gln
100          105          110

```


Ser Ser Asp Phe Lys Val Met Val Asn Gly Ile Leu Phe Val Gln Tyr
 115 120 125
 Phe His Arg Val Pro Phe His Arg Val Asp Thr Ile Ser Val Asn Gly
 130 135 140
 Ser Val Gln Leu Ser Tyr Ile Ser Phe Gln Pro Pro Gly Val Trp Pro
 145 150 155 160
 Ala Asn Pro Ala Pro Ile Thr Gln
 165

<210> 200
 <211> 132
 <212> PRT
 <213> Homo sapien

<400> 200
 Gly Gln Glu Lys Ser Leu Ala Ala Glu Gly Arg Ala Asp Thr Thr Thr
 1 5 10 15
 Gly Ser Ile Ala Gly Ala Pro Glu Asp Glu Arg Ser Gln Ser Thr Ala
 20 25 30
 Pro Gln Ala Pro Glu Cys Phe Asp Pro Ala Gly Pro Ala Gly Leu Val
 35 40 45
 Arg Pro Thr Ser Gly Leu Ser Gln Gly Pro Gly Lys Glu Thr Leu Glu
 50 55 60
 Ser Ala Leu Ile Ala Leu Asp Ser Glu Lys Pro Lys Lys Leu Arg Phe
 65 70 75 80
 His Pro Lys Gln Leu Tyr Phe Ser Ala Arg Gln Gly Glu Leu Gln Lys
 85 90 95
 Val Leu Leu Met Leu Val Asp Gly Ile Asp Pro Asn Phe Lys Met Glu
 100 105 110
 His Gln Ser Lys Arg Ser Pro Leu His Ala Ala Ala Glu Ala Gly His
 115 120 125
 Val Asp Ile Cys
 130

<210> 201
 <211> 120
 <212> PRT
 <213> Homo sapien

<400> 201
 Met Leu Val Leu Val Leu Gly Asp Leu His Ile Pro His Arg Cys Asn
 1 5 10 15
 Ser Leu Pro Ala Lys Phe Lys Lys Leu Leu Val Pro Gly Lys Ile Gln
 20 25 30
 His Ile Leu Cys Thr Gly Asn Leu Cys Thr Lys Glu Ser Tyr Asp Tyr
 35 40 45
 Leu Lys Thr Leu Ala Gly Asp Val His Ile Val Arg Gly Asp Phe Asp
 50 55 60
 Glu Asn Leu Asn Tyr Pro Glu Gln Lys Val Val Thr Val Gly Gln Phe
 65 70 75 80
 Lys Ile Gly Leu Ile His Gly His Gln Val Ile Pro Trp Gly Asp Met
 85 90 95
 Ala Ser Leu Ala Leu Leu Gln Arg Gln Phe Asp Val Asp Ile Leu Ile
 100 105 110
 Ser Gly His Thr His Lys Phe Glu

115

120

<210> 202

<211> 135

<212> PRT

<213> Homo sapien

<400> 202

Arg	Met	Cys	Ser	Leu	Thr	Phe	Tyr	Ser	Lys	Ser	Glu	Met	Gln	Ile	His
1				5					10					15	
Ser	Lys	Ser	His	Thr	Glu	Thr	Lys	Pro	His	Lys	Cys	Pro	His	Cys	Ser
			20					25					30		
Lys	Thr	Phe	Ala	Asn	Ser	Ser	Tyr	Leu	Ala	Gln	His	Ile	Arg	Ile	His
		35					40					45			
Ser	Gly	Ala	Lys	Pro	Tyr	Ser	Cys	Asn	Phe	Cys	Glu	Lys	Ser	Phe	Arg
	50					55					60				
Gln	Leu	Ser	His	Leu	Gln	Gln	His	Thr	Arg	Ile	His	Thr	Gly	Asp	Arg
65					70					75					80
Pro	Tyr	Lys	Cys	Ala	His	Pro	Gly	Cys	Glu	Lys	Ala	Phe	Thr	Gln	Leu
				85					90					95	
Ser	Asn	Leu	Gln	Ser	His	Arg	Arg	Gln	His	Asn	Lys	Asp	Lys	Pro	Phe
			100					105					110		
Lys	Cys	His	Asn	Cys	His	Arg	Ala	Tyr	Thr	Asp	Ala	Ala	Ser	Leu	Glu
		115					120					125			
Val	His	Leu	Ser	Thr	His	Thr									
		130				135									

<210> 203

<211> 135

<212> PRT

<213> Homo sapien

<400> 203

Leu	Leu	Leu	Ala	Arg	Trp	His	Ser	Ala	Ala	Phe	Lys	Val	Arg	Ala	Gly
1				5					10					15	
Ala	Arg	Gln	Glu	Leu	Ala	Met	Lys	Ser	Leu	Lys	Ser	Arg	Leu	Arg	Arg
		20						25					30		
Gln	Asp	Val	Pro	Gly	Pro	Ala	Ser	Ser	Gly	Ala	Ala	Ala	Ala	Ser	Ala
		35					40					45			
His	Ala	Ala	Asp	Trp	Asn	Lys	Tyr	Asp	Asp	Arg	Leu	Met	Lys	Ala	Ala
	50					55					60				
Glu	Arg	Gly	Asp	Val	Glu	Lys	Val	Thr	Ser	Ile	Leu	Ala	Lys	Lys	Gly
65					70					75					80
Val	Asn	Pro	Gly	Lys	Leu	Asp	Val	Glu	Gly	Arg	Ser	Val	Phe	His	Val
			85					90					95		
Val	Thr	Ser	Lys	Gly	Asn	Leu	Glu	Cys	Leu	Asn	Ala	Ile	Leu	Ile	His
			100					105					110		
Gly	Val	Asp	Ile	Thr	Thr	Ser	Asp	Thr	Ala	Gly	Arg	Asn	Ala	Leu	His
		115					120						125		
Leu	Ala	Ala	Lys	Tyr	Gly	His									
		130				135									

<210> 204

<211> 167

<212> PRT

<213> Homo sapien

<400> 204

Ala Leu Gly Glu Ala Pro Asp His Ser Tyr Glu Ser Leu Arg Val Thr
 1 5 10 15
 Ser Ala Gln Lys His Val Leu His Val Gln Leu Asn Arg Pro Asn Lys
 20 25 30
 Arg Asn Ala Met Asn Lys Val Phe Trp Arg Glu Met Val Glu Cys Phe
 35 40 45
 Asn Lys Ile Ser Arg Asp Ala Asp Cys Arg Ala Val Val Ile Ser Gly
 50 55 60
 Ala Gly Lys Met Phe Thr Ala Gly Ile Asp Leu Met Asp Met Ala Ser
 65 70 75 80
 Asp Ile Leu Gln Pro Lys Gly Asp Asp Val Ala Arg Ile Ser Trp Tyr
 85 90 95
 Leu Arg Asp Ile Ile Thr Arg Tyr Gln Glu Thr Phe Asn Val Ile Glu
 100 105 110
 Arg Cys Pro Lys Pro Val Ile Ala Ala Val His Gly Gly Cys Ile Gly
 115 120 125
 Gly Gly Val Asp Leu Val Thr Ala Cys Asp Ile Arg Tyr Cys Ala Gln
 130 135 140
 Asp Ala Phe Phe Gln Val Lys Glu Val Asp Val Gly Leu Ala Ala His
 145 150 155 160
 Val Gly Thr Leu Gln Arg Leu
 165

<210> 205

<211> 381

<212> DNA

<213> Homo sapien

<400> 205

aaatttgga tcacgcctg ttctgaaac tagatgcacc aaccgtatca ttatttgttt 60
 gaggaaaaa agaaatctgc attttaattc atgttggtca aagtcgaatt actatctatt 120
 tatcttatat cgtagatctg ataaccctat ctaaaagaaa gtcacacgct aaatgtattc 180
 ttacatagtg cttgtatcgt tgcatttggt ttaatttggt gaaaagtatt gtatctaact 240
 tgtattactt tggtagtttc atctttatgt attattgata ttgtgaattt tctcaactat 300
 aacaatgtag ttacgctaca acttgccata aacattcaaa cttgttttct tttttctggt 360
 gttttctttg ttaattcatt t 381

<210> 206

<211> 514

<212> DNA

<213> Homo sapien

<400> 206

aaaagtaaat tgcataaaat tacatccaat ttctttctct aaaccaacat attcttcacc 60
 ttcacaaaagc aaacacatgg tgcactgaaa ccgagggtgt accagcttta catactgttc 120
 tgccatttgt ggggggtgca accacaacat aagtcagaaa aaaagctatc cagcttttcg 180
 tggaaatctgg tgaagtttac acttagcgat aagcctctaa gcctgaactt agcagggcta 240
 gcaaaaacttt atttatttcc taactcctat tatttttagaa tgggttttcaa aataatactg 300
 caagttccta attgaaatac aaaacagaac aaaaagctgt gagaaatctt ttttttctt 360
 tggctcctta aagacttggga ataatttata ttagtggtgc atacatttta ccttctacat 420
 tttgatgtac ttgctcttga aagcactaga acaaattaat tgaaataaaa cctctctgaa 480
 accatttgaa tctttgatcc taccatagag tttt 514

<210> 207
 <211> 522
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (522)
 <223> n = A,T,C or G

<400> 207
 caagctttttg gtgcatagca gccngcctgg aagcattctg agtgctctgt ctgccctggg 60
 gggtttcatt atcctgtctg tcaaacaggc caccttaaatt cctgcctcac tgcagtgtga 120
 gttggacaaa aataatatac caacaagaag ttatgtttct tacttttatac atgattcact 180
 ttataccacg gactgctata cagccaaagc cagtctggct ggaactctct ctctgatgct 240
 gatttgcact ctgctggaat tctgcctagc tgtgctcact gctgtgctgc ggtggaaaca 300
 ggcttactct gacttccttg ggagtgtact ttctctgcct cacagttaca ttggtaattc 360
 tggcatgtcc tcaaaaatga ctcatgactg tggatatgaa gaactattga cttcttaaga 420
 aaaaaggag aatatataat cagaaagtgt attcttatga taatatggaa aagttaacca 480
 ttatagaaaa gcaaagcttg agtttcttaa atgtaagctt tt 522

<210> 208
 <211> 278
 <212> DNA
 <213> Homo sapien

<400> 208
 aaaatgcact accccttttt tccaacacgg agcttaaaac aaattaatga aagagtggaa 60
 aattcaaaaat aagggaaga gataaggttt tttttttttt tcttttaaga tagactcagg 120
 ataggtagat agctttcact gatgtagatg tggataaat tattacttca ggaaaaaat 180
 tcccaaacat cttatgaaaa agtatacaac tctacttcaa aatatgctat ttactcactg 240
 ccaaagacag ttttatttga aatcttgttt ctgtattt 278

<210> 209
 <211> 234
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (234)
 <223> n = A,T,C or G

<400> 209
 cctcccaaat ttagcaggtg ctgggnagga ccctagggag tggtttatgg gggctagctg 60
 gtgaaactgc cctttccttt ctgttctatg agtgtgatgg tgtttgagaa aatgtggggc 120
 tatggttcag gcgcacttca catgtgcaaa gatggagaaa gcactcacct acacgtttag 180
 gctcagaatg ttgattgaaa cattttgaat gatcaaaaat aaaatgttat tttt 234

<210> 210
 <211> 186
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(186)
 <223> n = A,T,C or G

<400> 210
 aaaataactg atggcaaaat aaaanattta catcacatca tactgtgtaa acatgtaagg 60
 tctctgtaca aagaaatata catgcaaaat aatgtaaaaa ttttaactgaa ataataaaaag 120
 aaacaatata caaataaaaa ttatgagggt acgaatacac atccagtttc gaatccaatt 180
 tctttt 186

<210> 211
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 211
 aaaaattggt aaaatattta agtacaaaaat aagtagcttc cagcgagggt tttataccat 60
 agtaagagca cacaatagat attactagca cacatgggtt atctgggagc gctatagcta 120
 caataaacct aattatggaa cagaaatttg cattctgttt ccagtgtctac tacactccta 180
 ctttctcaaa agtctgtctt attaatatca gctcagtgcg gtttactatg aatagttttat 240
 gtctgtgatg caaagcatta attgttctct ttttacaac atacattttt ttcataagga 300
 agactggggg aaaacccaga aacatacaga gaaaaggaaa gcatcatcaa atatatgtta 360
 aaaattaaga tgatgtttac tactagtcac cctacaacaa ttt 403

<210> 212
 <211> 345
 <212> DNA
 <213> Homo sapien

<400> 212
 cctctttatg agttcattac tgctgttcag tctcggcaca cagacacccc tgtgcaccgg 60
 ggtgtacttt ctactctgat cgctgggcct gtggttgaga taagtcacca gctacggaag 120
 gtttctgacg tagaagagct taccctccca gagcatcttt ctgatcttcc accattttca 180
 aggtgtttta taggaataat aataaagtct tcgaatgtgg tcaggtcatt tttggatgaa 240
 ttaaaggcat gtgtggcttc taatgatatt gaaggcattg tgtgcctcac ggctgctgtg 300
 catattatcc tggttattaa tgcaggtaaa cataaaagct caaaa 345

<210> 213
 <211> 318
 <212> DNA
 <213> Homo sapien

<400> 213
 aaaatgtttt attattttga aaataatggt gtaattcatg ccagggactg acaaaagact 60
 tgagacagga tggttattct tgtcagctaa ggccacattg tgcctttttg accttttctt 120
 cctggactat tgaaatcaag cttattggat taagtgtatg ttctatagcg attgaaaggg 180
 caatagttaa agtaatgagc atgatgagag tttctgttaa tcatgtatta aaactgattt 240
 ttagctttac aaatatgtca gtttgcagtt atgcagaatc caaagtaaat gtccctgctag 300
 ctagttaagg attgtttt 318

<210> 214
 <211> 462
 <212> DNA
 <213> Homo sapien

<400> 214

aaacacatct	ggttctggca	gcaagttata	ttatgcattt	agagcaatag	gtgccctgaa	60
agttattgtt	gctttttttg	tttttttttt	cagtttgtgc	gtgtcacttg	aatcagaaac	120
caaacacatg	taaaaaaata	tcacctcaa	tgcccccat	taactctctc	tccagaaggt	180
gacaatgtta	gtgaactcaa	gactctcact	gatgatggta	ttttacaatg	aaaacacaag	240
gaaacccttt	gaggtccaat	tttcacatca	tattctccaa	atagtaaaat	agcagctcta	300
catgttgatg	aaaagaaatt	tcaatttctt	cctatttggt	tttactcata	tcaacattaa	360
tatgtatctg	gatttattaa	tttccaaaaa	gaaaatttta	gttaccaaat	atttcagaaa	420
tttaataaag	cattatatat	atgtaattag	cacttatcta	cc		462

<210> 215

<211> 280

<212> DNA

<213> Homo sapien

<400> 215

aaacttttct	gaaacgatta	gctgtagcca	aattatgtgg	ttacgttttg	ctacattaga	60
atttgaaaat	gcaatatgtg	tggtaaatct	actgtttgaa	atttataatg	gtctctgata	120
tgattcgaat	tttggttaact	tttgaaagtt	attttcccc	tttagtcatg	gatttctatt	180
tgttttttta	tgtaattttt	tctagaaagc	atctgaattg	actaggcttt	tcctatataa	240
aaaactcaaa	acttggttaac	tctgtacttt	aataaaattt			280

<210> 216

<211> 210

<212> DNA

<213> Homo sapien

<400> 216

aaaatctctg	gcttcaaagt	ttcttgggga	aaggctcggtt	tacctcacat	tttttgtttc	60
cattagtaat	attctaggta	cctcacaaaa	tgtattatgg	tgccatggct	gttagttttt	120
agtgagtgtc	gtaggattaa	ttcgaaaata	ggcagaattc	cattcctccc	aagggtggcaa	180
aaattagcta	tactgatgta	attgtcattt				210

<210> 217

<211> 398

<212> DNA

<213> Homo sapien

<400> 217

ctggagctgc	tagaacttga	gatgagggca	agagcgatta	aagccctaata	gaaagctggg	60
gatataaaaa	agccagccta	ggtatttaac	ttgattttga	attttaggta	tgtttgaaca	120
aagccacatc	atttaatttt	gtatctaaaa	tttatttggg	gtcttatatg	ttattttctca	180
tgtaaccttt	attaggactc	atttttagccc	taaattacct	gtggctgttt	ctttttatct	240
ttttgactac	ttttatatta	taaatgtgtg	ttactgtctt	atgaattcat	ggcaatatag	300
ttggatagcc	tggatacttt	gttagatgag	tatttagctg	tgtctgcaaa	tcctaaaagc	360
cattagcaaa	gagtcgtggg	atttttttct	ttattttt			398

<210> 218

<211> 487

<212> DNA

<213> Homo sapien

<400> 218

ctgccgccgg	tcaggctggg	taaagatcag	gtccccagg	accttgcgat	ttatgtcgcc	60
------------	------------	------------	-----------	------------	------------	----

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attctccagc aagacctcag tgccgaagac ctctacgatg cgccggtggg caggggatcc 120
tggtgcacg acgtgccggg ccacacgctc caggtcaatc accgcacagc ccagtttcag 180
tgtttttaca cattatattg ttataatctc acaataacta taaattaggt agaacaggaa 240
atgaggtttg gagaagatac ttgacttata cgaccatctg tacttggtccc atagtaagga 300
gcctcaagca gagacaaagg aggaagttgc ctatgttgta tgggtttacag gccataaatg 360
aatgtcatct ttttcctccc ctggggaaaa atgtctcaaa aatcccacca taggacatga 420
catctccaga acctctatta caaaatacac atttcctgta gaggggtaac aaatttgggt 480
taacctg 487

```

```

<210> 219
<211> 390
<212> DNA
<213> Homo sapien

```

```

<400> 219
aaaaaataca ccacacgata caactcaata caggagtatt tcttctcaaa ttcttctagc 60
accatcaaca ttcttcaagt atctgaaata ctattaatta gcacctttgt attatgaaca 120
aaacaaaaca aggacctcag ttcactctctg tctaggtcag cacctaacaa tgtggatcac 180
actcatggga aagtgttttg aggtagttta aacctttgga agtttgggtt ttaaacttcc 240
ctctgtggaa gatattcaaa agccacaagt ggtgcaaagt tttatgggtt ttatttttca 300
atttttatct tgggtttctt acaaagggtg acattttcca taacagggtg aagagtgttg 360
aaaaaaagt tcaaattttt gggggagcgg 390

```

```

<210> 220
<211> 341
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(341)
<223> n = A,T,C or G

```

```

<400> 220
aaaacaggca aagttttaca gagaggatac atttaataaa actgcgagga catcaaagtg 60
gtaaatactg tgaaatacct tttctnnnca aaaggcaaat attgaagttg tttatcaact 120
tcgctagaaa aaaaaaaaca cttggcatac aaaatattta agtgaaggag aagtctaacg 180
ctgaactnnn aatgaaggga aattgtttat gtgttatgaa catccaagtc tttcttcttt 240
tttaagttgt caaagaagct tccacaaaat tagaaaggac aacagttctg agctgtaatt 300
tcgccttaaa ctctggacac tctatatgta gtgcattttt a 341

```

```

<210> 221
<211> 234
<212> DNA
<213> Homo sapien

```

```

<400> 221
ccagggggaa ttgagggagg ctctaagcta ggggcactgc atggtgggac aggatggccc 60
cttgaggact gaaccctggg gagaagacaa acagtaataa taaaaacaaa taacaagtac 120
tttaagaatg gattgtatga cctatagtga cagatgacat cactaatact gaaagcttct 180
tatattaata attttggcaa aatgtcattt tgtaatatag tatatgcttt ccag 234

```

```

<210> 222
<211> 186
<212> DNA

```

<213> Homo sapien

<400> 222

aaattttcat	tgagttgtcc	atctccagca	tatagggctt	caggagcaga	gcagaccttg	60
tttttagtg	ttccatggga	taaaatggga	ttggaggagc	tagaagaatt	cagggctctgg	120
tcfaatctgc	cagtcttcct	gaaatatcga	aaatacacca	gggctgctat	atcagagcca	180
ccctgg						186

<210> 223

<211> 486

<212> DNA

<213> Homo sapien

<400> 223

ccataagcag	ataagtagca	gttcaactgg	atgtctctct	tctccaaatg	ctacagtaca	60
aagccctaag	catgagtggg	aaatcgttgc	ttcagaaaag	acttcaaata	acacttactt	120
gtgcctggct	gtgctggatg	gtatattctg	tgtcattttt	cttcattggg	gaaacagccc	180
acagagctca	ccaacaagta	ctccaaaact	aagtaagagt	ttaagctttg	agatgcaaca	240
agatgagcta	atcgaaaaag	ccatgtctcc	tatgcagtac	gcacgatctg	gtctgggaac	300
agcagagatg	aatggcaaac	tcatagctgc	aggtggctat	aacagagagg	aatgtcttcg	360
aacagtcgaa	tgctataatc	cacatacaga	tactgggtcc	tttcttgctc	ccatgagaac	420
accaagagcc	cgatttcaaa	tggctgtact	catgggccag	ctctatgtgg	taggtggatc	480
aaatgg						486

<210> 224

<211> 322

<212> DNA

<213> Homo sapien

<400> 224

aaatgttcac	tatgtcattt	agtgtccaac	tttacggata	ggttgactat	ctaaataggg	60
attttttagtc	attaaaaaaa	aatctagtca	ccaggaggat	ccctataact	caaaaataact	120
tgtttgtaaa	agaaaatttg	tttacttacc	cattagtaag	ttcctgcata	ttcattataa	180
gatggcaaat	caaacttttc	taggatgaag	acagcttatt	tttaagttgt	atagtcttag	240
ttggtttagg	gtctcaattt	taattaataa	aatacttgg	ttttatttgc	ttgtcctttt	300
gaattcctgt	tttaataatt	tt				322

<210> 225

<211> 489

<212> DNA

<213> Homo sapien

<400> 225

aaatgtagga	ataaaatggc	tggcatctaa	gcacttttagt	aaaagagggt	tttacaata	60
actaaggatt	gtagagcttc	cttctctttt	ttttctttt	tctttctttt	gttttacatg	120
aactcaactt	attcctaaca	tttgtctacc	tcaaagaaat	ttcaagatta	tttagataac	180
atggatatgt	gccaaatcct	ttgagctgtt	aagatgataa	tttcttgctt	tcctcctaca	240
tcttctcttc	ccactccctc	ctttgggtgtg	aatattggct	tcccaattaa	gacctttttt	300
ttttttttcc	agtttgtttt	agcttattat	aggttttgga	ggaactttgc	cattttgtaa	360
tctttcaaat	cattcttcac	ccttcctcac	atcagcttcc	tgcttttccc	agtgttttac	420
tgtaaatgtg	gtagcatatg	acaaatcttg	agctgacttt	cctcttcact	gatgtcatct	480
tgagctctt						489

<210> 226

<211> 398

<212> DNA

<213> Homo sapien

<400> 226

caagggccca	ccgcagagca	cacctatgct	atggggagcc	ctgctggcag	ccccgagagc	60
catgccatgg	cctgcaggag	ccaggctcct	gtgtggatga	agtccctctt	cctctgtgcc	120
ttgatccctt	gggggtgcct	ttggtcatct	cttctgtcct	ttcctgtctc	tgaaatagtc	180
atcactcccc	ttgactctct	ctgttcacgt	cttctcagtc	tcgagagtta	acttctgtaa	240
ggagtttaat	ctgggggttc	aagaaaacaa	gttccttggt	aacatagcac	tgactttgca	300
acaatagaaa	actaacaat	gagcaacaat	ataaagagta	gaggtagttc	tcattgggtg	360
taacttcaac	ccattctgct	tgtgggtaga	atttataa			398

<210> 227

<211> 535

<212> DNA

<213> Homo sapien

<400> 227

ctgctgcata	gaaaatatgc	taacatacaa	cagtcgaagt	taagcctgtg	catagagaag	60
ataaagcact	tatggtaact	gcaaattgta	acgagtcctt	aaggtttgta	caacctagta	120
tgggtccata	aggaaaaact	gtagtagaaa	tggtaggac	aaacaataaa	gtagaaacag	180
gggggaaact	tgagaagaga	agaaagaagc	aagaaaaaaa	gactttcaat	tgtataaaat	240
tcacaaacca	gtaaagtata	aagacaccat	ggagaaatgg	ttaactctgc	cccaaacc	300
caacagcaaa	caaaaccaga	atgaataagc	ctttggcaga	caattttaga	aatttgaatg	360
ttacatttct	caataattca	caaacaatat	atttatatgg	atatttatat	taaatattgg	420
gaaaccaatg	ttgtaaattt	gatgcttata	atgctttagc	caatgagagc	acaatgatat	480
caatcaagct	aaatgaatgc	tgggtgtatc	acaacagtc	tcatttatga	aacaa	535

<210> 228

<211> 301

<212> DNA

<213> Homo sapien

<400> 228

aaacaataaa	caccatcaac	cttattgact	ttattgtccc	tcaaattata	ttgactgttg	60
tgattccatc	aagtttgtac	actcttttct	ctccctgttt	tcgagcaaca	aattgcgaag	120
tgcttttgtt	tgtttgtttt	cgtttggtta	aagcttattg	ccatgctggg	gcggctatgg	180
agactgtctg	gaaggcttgg	aatggtttat	tgcttatggg	aaaatttgcc	tgatttctta	240
caggcagcgt	ttggaaacct	ttatttatat	agttgtttac	atacttataa	gtctatcatt	300
t						301

<210> 229

<211> 420

<212> DNA

<213> Homo sapien

<400> 229

aaagttgctt	tgctggaagt	ttttataagg	aatctcagat	taaaccttta	gaagtttaat	60
tgacactag	aagccaaacc	aaggctgact	tcagactttg	ttttagtagc	ctgtgggttt	120
attacctatg	ggtttatatc	ctcaaatacg	acattctagt	caaagtcttg	gtaatatatac	180
caatgttttc	aaatgtattc	tgtcatacaa	agagcagatt	tttattgaac	ttgtgcaata	240
actatattac	catacaatat	aaatattcat	gaatagtttc	ccaagtctgg	agcgaccaca	300
tagggagaaa	atgcaaatgt	ctcaattttt	gttcacaaaa	gtatatttta	tcaaattgct	360
gtaagctgtg	gatagcttaa	aagaaaaaaa	gtttcctgaa	atctgggaaa	caagacattt	420

<210> 230
 <211> 419
 <212> DNA
 <213> Homo sapien

<400> 230
 gtgaagtcct aaagcttgca ttccaccagc ttctacaata gccggcttat tactagagca 60
 gacagatagc accttcagca ctctgcttgt ggtccacagt agtttttcgt aagtataggt 120
 cctcattata ttctactaaag cttgggggtcc accactagcc agtatgatga gcttgctttc 180
 ttggttgccca taagctaaaa ttgaaggga gtctgtcgta atagccaaga atttaacatt 240
 tgttttgttg agcaaggcaa ccattttctg cagcccacca gctaaacgca ctgccatttt 300
 agctccttct tgatgtaata aaagggtgtg gagagttgta atggcataaa acaacacaga 360
 atccactggt gaaccaagca ttttcaccag ggcaggaatg cctccagact taaagatgg 419

<210> 231
 <211> 389
 <212> DNA
 <213> Homo sapien

<400> 231
 ttgttcagag ccctgggtgga tcttgcaatc cagtgcctta caaaggctag aacactacag 60
 gggatgaatt cttcaaatag gagccgatgg atctgtggtc ctttgggact catcaaagcc 120
 ttggtttagc attttgtcag ttttatcttc agaaattctc tgcgattaag aagataattt 180
 attaaagggt gtccttccta cctctgtggt gtgtgtcgcg cacacagctt agaagtgcata 240
 taaaaaagga aagagctcca aattgaatca cctttataat ttaccattt ctatacaaca 300
 ggcagtggaa gcagtttcag agaacttttt gcctgcttat ggttgatcag ttaaaaaaga 360
 atgttacagt aacaaataaa gtgcagttt 399

<210> 232
 <211> 397
 <212> DNA
 <213> Homo sapien

<400> 232
 ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt 60
 cacagtggaa ctgaaggaag gctctacagc ccagcttata ataaacactg agaaaactgt 120
 gattggctct gttctgctgc gggaactgaa gcctgtcctg tctcaggggt aacctgctta 180
 catctggact ttagaatctg gcacacaaca aaagtgcctg gcattccacta ctgctgcctt 240
 tcatttataa taatagcctt tccatctggc agtgggggaa gaatacactc ttgacattct 300
 tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaatactt tccccctttt 360
 tgcttttgcta accaaagagc atatatttta ctgtcag 397

<210> 233
 <211> 508
 <212> DNA
 <213> Homo sapien

<400> 233
 cgaggagtgc cttaagtgcg aggacctcaa agtgggacaa tatatttgta aagatccaaa 60
 aataaatgac gctacgcaag aaccagttaa ctgtacaaac tacacagctc atgtttcctg 120
 ttttcagca cccaacataa cttgtaagga ttccagtggc aatgaaacac attttactgg 180
 gaacgaagt ttgtttttca agcccatatc ttgccgaat gtaaatggct attcctacaa 240
 agtggcagtc gcattgtctc tttttcttgg atggttggga gcagatcgat ttacacttgg 300
 ataccctgct ttgggtttgt taaagttttg cactgtaggg ttttgggaa ttgggagcct 360
 aattgatctt attcttattt caatgcagat tgttggacct tcagatggaa gtagttacat 420

tatagattac tatggaacca gacttacaag actgagtatt actaatgaaa catttagaaa 480
aacgcaatta tatccataaa tattttttt 508

<210> 234
<211> 358
<212> DNA
<213> Homo sapien

<400> 234
aaatgttggg attcaaaacc aaagatataa cggaaaggaa aaacagatga gacataaaat 60
gatttgcaag atgggaaata tagtagttta tgaatgtaa ttaaattcca gttataatag 120
tggctacaca ctctcactac acacacagac cccacagtc tatatgccac aaacacattt 180
ccataacttg aaaatgagta ttttgcata ctcagttcag gatatgtttt ttacaagtta 240
atcctaaagt cataaagcaa gaagctattc atagtacaag attttatttg ctaagcttta 300
caaattaaac tctaaaaaat tattacaatg atactgaaag atattttatt ggccctttt 358

<210> 235
<211> 482
<212> DNA
<213> Homo sapien

<400> 235
gaagaaagtt agatttacgc cgatgaatat gatagtgaat tggatttttg cgtagggtttg 60
gtctagggtg tagcctgaga ataggggaaa tcagtgaatg aagcctccta tgatggcaaa 120
tacagctcct attgatagga catagtggaa gtgagctaca acgtagtacg tgcgtgtag 180
tacgagtct agtgatgagt ttgctaatac aatgccagtc aggccaccta cggtgaaaaag 240
aaagatgaat cctagggtct agagcactgc agcagatcat ttcataattgc ttccgtggag 300
tgtggcgagt cagctaaata ctttgacgcc ggtggggata gcgatgatta tggtagcgga 360
ggtgaaatat gtcgtgtgt ctacgtctat tcctactgta aatatatggt gtgctcacac 420
gataaacctt aggaagccaa ttgatatcat agctcagacc atacctatgt atccaaatgg 480
tt 482

<210> 236
<211> 149
<212> DNA
<213> Homo sapien

<400> 236
cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagttag 60
ggcaacacca agaaggctct gcggagagac tcctgtggg ttggggcctg gcaggaacgg 120
tgctgtgga ctgtttatgg tctgtccag 149

<210> 237
<211> 391
<212> DNA
<213> Homo sapien

<400> 237
gaagctaaat ccaaagaaat atgaaggtag ccgtgaatta agtgatttta ttagctatct 60
acaaagagaa gctacaaacc cccctgtaat tcaagaagaa aaaccaaga agaagaagaa 120
ggcacaggag gatctctaaa gcagtagcca aacaccactt tgtaaaagga ctcttccatc 180
agagatggga aaaccatttg ggaggactag gacccatatt ggaattatta cctctcaggg 240
ccgagaggac agaattggata taatctgaat cctgttaaat tttctctaaa ctgtttctta 300
gctgactgt ttatggaaat accaggacca gtttatgttt gtggttttgg gaaaaattat 360
ttgtgttggg ggaaatgttg tgggggtggg g 391

<210> 238
<211> 374
<212> DNA
<213> Homo sapien

<400> 238
aaaaaaca aa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
atcataaaact cataaaaaata attttaagat gccggaaaag gatactttga ttataataaaa 120
acactcatgg atatgtaaaa actgtcaaga ttaaaattta atagtttcat ttatttggtta 180
ttttatttgt aagaaatagt gatgaacaaa gatccttttt catactgata cctgggttgta 240
tattatttgg tgcaacagtt ttctgaaatg atatttcaaa ttgcatcaag aaattaaaaat 300
catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca ttgggaaaaa 360
aaaaaaaaaa aaaa 374

<210> 239
<211> 200
<212> DNA
<213> Homo sapien

<400> 239
aaagatgtct ttgaccgcat atgtactgga aatttcaaac gtggatcttc ccaggttgta 60
gtctttgtgt tatgatcaat gaagaagggc cggccgtttg gcgctatcct catttcccag 120
ccgggtggca agaagctctg tgtgactttg tgtgtgggtt tgggggagtt gtaagggtgat 180
ggctgtgggg actgtgggtt 200

<210> 240
<211> 314
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(314)
<223> n = A,T,C or G

<400> 240
ctggtaaaact gtccaaaaca aggttccaaa taacacctct tactgattta ccctacccat 60
acatatncca natagnnttt gatcaaaaac atgaaatana tccacctgct tattttaagc 120
atattaaaaa ggaaactaat tggaccattt tctatttgct tattttatac aaaaaggcta 180
cacaattgat acactctatt cagataacaa tcaattagag tgantatgaa ttactggcga 240
caccatcact caattcttaa aaattagaaa ttgctgtagc agtattcact ataacttaac 300
actaccgaga gact 314

<210> 241
<211> 375
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(375)
<223> n = A,T,C or G

<400> 241

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ccaagtcctt ggagttatag gatattcatt acttcctctc attgtaatag cccctgtact      60
tttggtggtt ggatcatttg aagtgggtgc tacacttata aaactgtttg gtgtgttttg      120
ggctgcctac agtgcctgct cattgttagt ggggtgaagaa ttcaagacca aaaagcctct      180
tctgatttat ccaatctttt tattatacat ttatcttttg tcgttatata ctggtgtgtg      240
atccaagtta tacatgaata gaaaaagatg gtgttaaatt tgtgtgtagg ctgggaattc      300
tngctaaagg aatggnaaaa aacctgtntt tgnaaaattn acntgtccca aagnnaagga      360
anctaaacgc tttttt                                     375

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<210> 242
<211> 387
<212> DNA
<213> Homo sapien

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<400> 242
aaagggcattc tctgattttac atgagaattg agaaactgag atgtatgatt tgtctgttag      60
tcaatttcac accctttcat tctcataagc cccaaatttt gctcagttaa ggagcttgct      120
ttagggccac ctatgtaagt ctgttatact agctaattgtg cccatttgaa tagttcaagg      180
gtcagctaat gctctgagct tcatggctcc agtataaaga acaaatttaa caaaattaag      240
ctgttactgt agccgagtta cccttctgct ccacacatat gtagtgggat cttgcaggat      300
ttccatagtg ccaattatca aaggccttga ctacttagca ttgctgtatt acagatgtgc      360
aaactgaggc actgaaaagt caaattt                                     387

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<210> 243
<211> 536
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(536)
<223> n = A,T,C or G

```

```

<400> 243
aaacccaaag gacgaagaaa aaacactttt aaaaaaaaaa aaaaaaaaga aaaacccaaac      60
catattttgc cacatgtgag agtacgggtca agcagtattt acaaaaagggt taacggaaca      120
acactctgac acatgctctg agaatactgg gactgctgtt tcaaaaaaaa aggttcaaac      180
ttattgtcac agcatcatca caaaatagag gatcaccatt ggtttgcttg gcttttcttt      240
ttttttttcc cccaagtgag gacctaaact caaataatac aatagaatat gcaaattatc      300
ttcacatcaa gagtacccca agaaaaacga aatccatggc acanacactg tacaaggggtg      360
cagggcaggg ctctgagggg cccaaacccc attttgccaa ctcgattttc tagcattgaa      420
gggagcaagg ggctaggcat atgatggaga tgatactgaa atgattttat caaaatccat      480
gcaaatcaag ttctttggat agaggtgaan aacttgagaca tggctgtttc aggcag      536

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<210> 244
<211> 397
<212> DNA
<213> Homo sapien

```

```

<400> 244
ccaggataat atacacaggt ttgcagctaa aactgtgcac agtgggtcat tgatgctagt      60
cacagtggaa ctgaaggaag gctctacagc ccagcttata ataaacactg agaaaactgt      120
gattggctct gttctgctgc gggaactgaa gcctgtcctg tctcaggggt aacctgctta      180
catctggact ttagaatctg gcacacaaca aaagtgcctg gcatccacta ctgctgcctt      240
tcattttata taatagccct tccatctggc agtgggggaa gaatacactc ttgacattct      300
tgtctcctgc tttagaatgc tagtgtgtat ctatcatgta tgcaataact tccccctttt      360

```

tgcttttgcta accaaagagc atatatttta ctgtcag

397

<210> 245

<211> 508

<212> DNA

<213> Homo sapien

<400> 245

cgaggagtcg	cttaagtgcg	aggacctcaa	agtgggacaa	tatatttgta	aagatccaaa	60
aataaatgac	gctacgcaag	aaccagttaa	ctgtacaaac	tacacagctc	atgtttcctg	120
ttttccagca	cccaacataa	cttctaagga	ttccagtggc	aatgaaacac	atcttactgg	180
gaacgaagtt	ggttttttca	agcccatatc	ttgccgaaat	gtaaaaggct	attcctacaa	240
agtggcagtc	gcattgtctc	tttttcttgg	atgggtggga	gcagatcgat	tttaccttgg	300
ataccctgct	ttgggtttgt	taaagttttg	cactgtaggg	ttttgtggaa	ttgggagcct	360
aattgatnnc	attcttattt	caatgcagat	tggtggacct	tcagatggaa	gtagttacat	420
tatagattac	tatggaacca	gacttacaag	actgagtatt	actaatgaaa	catttagaaa	480
aacgcaatta	tatccataaa	tatttttt				508

<210> 246

<211> 358

<212> DNA

<213> Homo sapien

<400> 246

aaatgttgg	attcaaaacc	aaagatataa	ccgaaaggaa	aaacagatga	gacataaaat	60
gatttgcaag	atgggaaata	tagtagttta	tgaatgtaaa	ttaaattcca	gttataatag	120
tggctacaca	ctctcactac	acacacagac	cccacagtcc	tatatgccac	aaacacattt	180
ccataacttg	aaaatgagta	ttttgcatat	ctcagttcag	gatatgtttt	ttacaagtta	240
atcctaaagt	cataaagcaa	gaagctattc	atagtacaag	attttatttg	ctaagcttta	300
caaattaaac	tctaaaaaat	tattacaatg	atactgaaag	atattttatt	ggcctttt	358

<210> 247

<211> 673

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(673)

<223> n = A,T,C or G

<400> 247

gaagaaagtt	agattttacgc	cgatgaatat	gatagtgaag	tggatttttg	cgtaggtttg	60
gtctaggggtg	tagcctgaga	ataggggaaa	tcagtgaatg	aagcctccta	tgatggcaaa	120
tacagctcct	attgatagga	catagtggaa	gtgagctaca	acgtagtacg	tgctgtgtag	180
tacgatgtct	agtgatgagt	ttgctaatac	aatgccagtc	aggccaccta	cggtgaaaag	240
aaagatgaat	cctaggggctc	agagcactgc	agcagatcat	ttcatattgc	ttccgtggag	300
tgtggcgagt	cagctaaata	ctttgacgcc	gggtggggata	gcgatgatta	tggtagcgga	360
ggtgaaatat	gctcgtgtgt	ctacgtctat	tcctactgta	aatatatggt	gtgctcacac	420
gataaaccct	aggaagccaa	ttgatatcat	agctcagacc	atacctatgt	atccaaatgg	480
ttcttttttt	ccggagttagt	aagttacaat	atgggagatt	attccgaagc	ctggtaggat	540
aagaatataa	acttcagggt	gaccgaaaaa	tcagaatagg	tggttggtata	gaatggggctc	600
tcctnctccg	cggggtcnaa	gaaggtgggtg	ttgangttgc	cggnctgtta	ntagtatagn	660
gatgccanca	gct					673

<210> 248
 <211> 149
 <212> DNA
 <213> Homo sapien

<400> 248
 cctcttcatt gttcacatgt cacaggagga ggctctgagc aaaggccact ggcaagttag 60
 ggcaacacca agaaggctct gcggagagac tcctgtgagg ttggggcctg gcaggaacgg 120
 tgcctgtgga ctgtttatgg tctgtccag 149

<210> 249
 <211> 458
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(458)
 <223> n = A,T,C or G

<400> 249
 gaagctaaat ccaagaaat atgaagggtg ccgtgaatta agtgatttta ttagctatct 60
 acaaagagaa gctacaaacc cccctgtaat tcaagaagaa aaaccaaga agaagaagaa 120
 ggcacaggag gatctctaaa gragtagcca aacaccactt tgtaaaagga ctcttccatc 180
 agagatggga aaaccattgg ggaggagtag gaccatattg ggaattatta cctctcaggg 240
 ccgagaggac agaattgata taatctgaat cctgttaaat tttctctaaa ctgtttctta 300
 gctgcactgt ttatggaaat accaggacca gtttatgttt gtggttttgg gaaaaattat 360
 ttgtgttggg ggaaatgttg tgggggtggg gttgagttgg ggtatatttc taattttttt 420
 tgtacatttg gaacagtgc aataaatgan accccttt 458

<210> 250
 <211> 374
 <212> DNA
 <213> Homo sapien

<400> 250
 aaaaaacaaa acaatgtaag taaaggatat ttctgaatct taaaattcat cccatgtgtg 60
 atcataaact cataaaaaata attttaagat gccggaaaag gatactttga ttaataaaaa 120
 acactcatgg atatgtaaaa actgtcaaga ttaaaattta atagtttcat ttatttgtaa 180
 ttttatttgt aagaaatagt gatgaacaaa gatccttttt cactatgata cctggttgta 240
 tattatttga tgcaacagtt ttctgaaatg atatttcaaa ttgcatcaag aaattaaaaat 300
 catctatctg agtagtcaaa atacaagtaa aggagagcaa ataaacaaca tttggaaaaa 360
 aaaaaaaaaa aaaa 374

<210> 251
 <211> 356
 <212> DNA
 <213> Homo sapien

<400> 251
 aaagatcttc tctaacaagc tatgggaatt tggcttcata ctctttcttt gcaacagcag 60
 tgttctgggt gataattttg aattgatacc tgttcctttt tctgggtttt gttggctttt 120
 tgaaaaattg tctttcctta tcattggtgg gaggcttggg agcaaagtaa catttttttg 180
 aaaaggaggac agaaaaattg aactacagct tgagaacgta ttcttttttt cctactttgt 240
 tattgcaaat tgaggaaatca cttttaactg ttttaggtgt gtgtgtccag agtgagcaag 300

gattatgttt ttggattgtc aaagaggatg cttagtctta aaataaaaat aaattt 356

<210> 252
 <211> 484
 <212> DNA
 <213> Homo sapien

<400> 252
 ctggtaaact gtccaaaaca aggttccaaa taacacctct tactgattta ccctacccat 60
 acatatccca aatagttttt gatcaaaaac atgaaataga tccacctgct tattttaagc 120
 atattaaaaa ggaaactaat tggaccattt tctatttgtc tattttatac aaaaaggcta 180
 cacaattggt acactttatt cagattacaa ttaattagag tgattatgaa ttagtggtct 240
 acaccattac tcaattctta aaaattagaa attgctgtag cagtattcac tataacttaa 300
 cactacgaga gacttaaaaa acagtactg caaaaaaaaa aaagagctac ttcaaagcaa 360
 gcaaaagtcag taccattaca gatattctta aaaaaaaaaa aaaatttaac aagcaaggct 420
 agggtttgat aaattccatc ttgtgatcca ttcttgtgca ttcttcactt cttgagtcac 480
 tccc 484

<210> 253
 <211> 379
 <212> DNA
 <213> Homo sapien

<400> 253
 aaaaagcgct tagacttccc ttcccatctg gaacatgtaa aattttgcag caacagggtt 60
 tctccaattc cttcagcaag aattcccagc ctacacacaa atttaacacc atcttttct 120
 attcatgtat aacttggatc acacaccagt atataacgac aaaagataaa tgtataataa 180
 aaagattgga taaatcagaa gaggtttttt ggtcttgaat tcttcaccca ctaacaatga 240
 agcagcactg taggcagccc aaaacacacc aaacagtttt ataagtgtag acaccacttc 300
 aaatgatcca accaccaaaa gtacaggggc tattacaatg agagggaagta atgaatatcc 360
 tataactcca aggacttgg 379

<210> 254
 <211> 387
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)... (387)
 <223> n = A,T,C or G

<400> 254
 aaatttgact ttctcagtgc tcagtttgca catctgtaat acagcaatgc taagtagtca 60
 aggccnttga taattggcac tatggaaatc ctgcaagatc ccactacata tgtgtggagc 120
 agaagggtaa ctcggttaca gtaacagctt aattttgtta aatttgttct ttatactgga 180
 gccatgaagc tcagagcatt agctgacctt tgaactattc aaatgggcac attagctagt 240
 ataacagact tacataggtg ggcctaaagc aagctcctta actgagcaaa atttggggct 300
 tatgagaatg aaagggtgtg aaattgacta acagacaaat catacatctc agtttctcaa 360
 ttctcatgta aatcagagaa tgccttt 387

<210> 255
 <211> 225
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (225)
 <223> n = A,T,C or G

<400> 255
 aaatgtcttg tttcccagat ttcaggaaan tttttttctt ttaagctatc cacagcttac 60
 agcacctttg ataaaatata cttttgtgaa caaaaattga gacatttaca ttttctccct 120
 atgtggtcgc tccagacttg ggaaactatt catgaatatt tatattgtat ggtaatatag 180
 ttattgcaca agttcaataa aaatctgctc tttgtatgac agaatt 225

<210> 256
 <211> 544
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (544)
 <223> n = A,T,C or G

<400> 256
 ccttgcttaa agcccagaag tggtttaggc ntttggaana tctggttcac atcataaaga 60
 acttgatttg aaatgttttc tatagaaaca agtgctaagt gtaccgtatt atacttgatg 120
 ttggtcattt ctcagtccta tttctcagtt ctattatttl agaacctagt cagttcttta 180
 agattataac tggctctaca ttaaaataat gcttctcgat gtcagatttt acctgtttgc 240
 tgctgagaac atctctgcct aatttaccaa agccagacct tcagttcaac atgcttcctt 300
 agcttttcat agttgtctga catttccatg aaaacaaagg aaccaacttt gttttaacca 360
 aactttggtt gggttacagtt ttcaggggag cgtttcttcc atgacacaca gcaacatccc 420
 aaagaaataa acaagtgtga caaanaaaaa aacaaaccta aatgctactg ttccaaagag 480
 caacttgatg gtttttttta atactgagtg caaaaggnca cccaaattcc tatgatgaaa 540
 tttt 544

<210> 257
 <211> 420
 <212> DNA
 <213> Homo sapien

<400> 257
 aaatgtcttg tttcccagat ttcaggaaac tttttttctt ttaagctatc cacagcttac 60
 agcaatttga taaaatatac ttttgtgaac aaaaattgag acatttacat tttctcccta 120
 tgtggtcgtc ccagacttgg gaaactattc atgaatattt atattgtatg gtaatatagt 180
 tattgcacaa gttcaataaa aatctgctct ttgtatgaca gaatacattt gaaaacattg 240
 gttatattac caagactttg actagaatgt cgtatttgag gatataaacc cataggtaat 300
 aaacccacag gtactacaaa caaagtctga agtcagcctt ggtttggtt cctagtgtca 360
 attaaacttc taaaagttta atctgagatt ccttataaaa acttcagca aagcaacttt 420

<210> 258
 <211> 736
 <212> DNA
 <213> Homo sapien

<400> 258
 aaacaaaatg ctaaacctaa aaacattggt ctgtcagttc ccaaattaaa tctacttaga 60

```

acaaaaacaa aaatttatag ctcggtcaca tactacttaa ataattattgt tcaggcatct 120
ctaaaatcct ccatgttttc aagtatggaa atagaactca aatattccac aatacagtac 180
taaacagatg gagtatttag gaaagacttt gttgtcatat ggcacaatat taatattttg 240
ttgcttcaat acgttttgaa ataaatatca gatttttggt tttttttcct aaaagaccaa 300
aattataatc tacattaaga taattctgac tgtgggtaag acttaagagt gtaaaatata 360
acatcaatat tttatcacaa aagtaaagct ggtaacaaat tataaaagga gccagtactc 420
tactgagaca ggctcggaga ttaaagctca tcatgataga aatagtcatc atggagctgt 480
ctgccataat ctgtggcttc actgggtgaga aacaagtccg ggttttccag aatctcttct 540
tcagagagct ttttgtcacc attcaaacc atttcatcaa ttagatgaag cgcctcctct 600
tgtgcaatgc cctgattatt aggtctaccc aaggtaacag ctcttgggga tcaagcctgc 660
catcgttatc tttgtcataa tcattcaccg aatctgtctt tctcacaagt atcccattct 720
ggatcttcat ttgcag 736

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<210> 259

<211> 437

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(437)

<223> n = A,T,C or G

<400> 259

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aaaaccatac tgaaatcatt taccaaataa cnaagatctt aatctaaaag atagtgaata 60
catcatcatc atgaaatctg gttttatgtg ctctatgaag tacttggaga attgcttttt 120
tatttttctt ttgctttatt aggtcacaca aaacagaatg aattagcaga aaaatgtatg 180
ttataaaaca gcatttacta cttcaattta atttttttta ctaacaattg tggacctttt 240
tgatgacact tatgtatgtt tttataaat tatgtactta ttagtactta atgagccctt 300
cctgcctcaa tataaaatta ctaaaacttg agaattacag attttattgt aggcctgat 360
gttagtcact ttggagaagc taaaaatttg gaaatgatgt aattcccact gtaatagcat 420
agggattttg gaagcag 437

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<210> 260

<211> 592

<212> DNA

<213> Homo sapien

<400> 260

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tttttttttt gaaaaatata aaattttaat aaaggctaca tctcttaatt acaataatta 60
ttgtaccaag taattttcct faaatgaact ctttataatg cataatttac agtataagta 120
gaacaaaatg tcatgacaaa agtcattgag tacaagactt gtaataaaaaa ggcataaaat 180
atattttatac ataaaccctt ttcaaaaaaac aagggaagc ttgagccctc aatatagggc 240
gacacacgga gcgggtgacc gtgcaggtag aggtactgta ctgatttaa gtcaagcact 300
agagatagtg gattaatact cttttgccgt aactatata cagatgtata gtacaagtaa 360
caatggcaaa cagaatgtac agattaactt aacacaaaaa cccgaacatc aaaatgaagg 420
tgtgtggagg aaagggtgctg ctgggtctcc ctacaactgt tcatttcttt gtggggcagg 480
gggtagttcc tgaatggctg tgggtccaatg actaatgtaa aacaaaaaca gaaacaaaaa 540
aaacaaggaa ctgtcatttc cacgaaagca cagcggcagt gattctagca gg 592

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<210> 261

<211> 450

<212> DNA

<213> Homo sapien

<400> 261
 gtggcagggc ccagccccga accagacaag ggacccctca aggagcttca ttctagcatg 60
 agaaaattga gaagtaaacc agaaagttac agaatgtctg aaggggacag tgtgggagaa 120
 tccgtccatg ggaaaccttc ggtggtgtac agatttttca caagacttgg acagatttat 180
 cagtcctggc tagacaagtc cacaccctac acggctgtgc gatgggtcgt gacactgggc 240
 ctgagctttg tctacatgat tcgagtttac ctgctgcagg gttggtacat tgtgacctat 300
 gccttgggga tctaccatct aaatcttttc atagcttttc tttctcccaa agtggatcct 360
 tccttaatgg aagactcaga tgacggtcct tcgctaccca ccaaacagaa cgaggaattc 420
 cgccccctca ttcgaaggct cccagagttt 450

<210> 262
 <211> 239
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (239)
 <223> n = A,T,C or G

<400> 262
 taactttgat gacaaaatct aaaattaaag anttagtctt aaaagcctat agtgacttgt 60
 ttacttgcac aaataatatt ttcacttagt acaggctatt aatataagta atgagaattt 120
 aagtattaac tcaaaaaaag atagaggctc caaacttttc taagaaatta atgcattttc 180
 aaagtaataa tataatcaat ctgtaagtca aaagtaattt catattcatt gccaaattt 239

<210> 263
 <211> 376
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (376)
 <223> n = A,T,C or G

<400> 263
 aaaaaaaaaa aaaaaaaatt ccttgtngtt tnttagagga aaaaaagaaa aaccccaact 60
 ttancactg atactacata ttgctctgtt aaagaatttt ctctgccaaa aaaaagaaaa 120
 aacaaaaaaa cgcttaaagc tggagtttga cattctgctt tcagatgctg tctttttatt 180
 agtgagtgat gatggtttgc taataatcaa taggtaataa ttttttgtaa tcccatcaag 240
 tggctccata tgtttctgct ctctcgtgac tgtgttaatg tttaactgtt gtaccttaaa 300
 gccgaaatca gtaactatgc atactgtaac caaggtattg ggcttacaga gttgtttgtt 360
 gnataagaaa aatttt 376

<210> 264
 <211> 207
 <212> DNA
 <213> Homo sapien

<400> 264
 aaattagcat tccacaaata tacaggtaat ttaataatta ttgtgcatga atacatacac 60
 aatgcttata tatacaaatt ccagtttgtt ttcattgtgt ggcaagggat ttgtatacaa 120
 tcaaaagctg tgttcatatt ggtcccatg aatattcaca atacaaaagc acaaaagaac 180
 cattgattta caaaaggaaa tctattt 207

<210> 265
 <211> 388
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(388)
 <223> n = A,T,C or G

<400> 265
 naactgcact ttatttggtta ctgtaacatt nttttttaac tgatcaacca taagcatgca 60
 aaagncncct gaaactgctt ccactgcctg ttgtatagaa atgggtaaata tataaagggtg 120
 attcaatttg gagtccttcc cttttttata gcacttctaa gctgtgtgcg cgacacacac 180
 cacagaggta ggaaggacca cttttaataa attatcttct taatcgcaga gaatttctga 240
 agataaaact gacaaaatgc taaaccaagg ctttgatgag tcccaaagga ccacagatcc 300
 atcggctcct atttgaagaa ttcacccctc gtagtggtct agcctttgta gggcactgga 360
 ttacaagatc caccagggtc ctgaacaa 388

<210> 266
 <211> 616
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(616)
 <223> n = A,T,C or G

<400> 266
 aaatacagag tcaaaagatg atttataaaa tntaaaacat tttctgcttg gccgtatttg 60
 aagacaagct gaatacatat ctatgttctg aataagtcca ctatggatat atataggaag 120
 agatatacat atatccatcc acagatacac acacacatat atatttctgc atgtatatat 180
 acataattct ttctatagtt acaggaaata cttcttctat aattctgatt ttgactccca 240
 tcctccacca ttactcacc cactcattac ctaaatcttg gctttcttcc ctatattgta 300
 aataatccat ccaaacttct agccagtaact gtcaggagggt ttcttgctcg agtgagctgt 360
 taatactatt ttccactgac aacttctgca catcgaggac acagtgtatc tgaagactcc 420
 gctgtatact tccaacaacg ggggcatttt tctttcgtag tcggcatgac aattacttta 480
 taggaagact cttcacgaat atcaccacct tctaagttga tgaggaattt ccctttaagc 540
 tcgattacat ctgcagtcac ctctcgtggt tcctgaccag taaagttgac tcagaagcca 600
 tcattaattc attcaa 616

<210> 267
 <211> 341
 <212> DNA
 <213> Homo sapien

<400> 267
 ccattatgta tgtattttct tgaaaaatac ttatttcagc tacttatttt taatagttac 60
 ttattcttgt tgtattgtca tttgagtttt gtatatattt ttgatattaa ccccttgcca 120
 catgtataat ttgcaaatat tttctccctt tttttagttg tcacattctg ttcatgtgat 180
 cagattctgt gcagcagctt ttaatttga agtgatctga ctgacttggt cttccttttg 240
 tgtcctggga ttttaggtt aaatcaaaaa acttgctgcc cagaccaatg ttatggggct 300
 ttcactctat tttttggtag tagtagttta agagtttttag g 341

<210> 268
 <211> 367
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(367)
 <223> n = A,T,C or G

<400> 268
 ttgtagattg gaatagcaaa agtgaatgct ntgaccaaaa tttttgccct cctaaataaa 60
 gacgtntcct tctagagagc aaatctatca taaaatgtca aaactagaag agaataaaat 120
 gaaaggaaaa aacctagaaa aatatcctaa aatatcaaat gcagtcattt ctaaataataa 180
 gccataatta tagctttacc tattgttctt attgttecta tgctgcttct acaatgttac 240
 atcaactata cttagcttta ctctcccaa atcttggtga tgaagccttc tgagtgtgct 300
 ttccaatgtg ccagaaccag aagggcattc caaggcttcc ccacatttcc tccattttacg 360
 gagacag 367

<210> 269
 <211> 270
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(270)
 <223> n = A,T,C or G

<400> 269
 caaatctctc cctcactaga cgtaagccnt ttntcactc tctcaatctt atgcatcata 60
 gnaangcngn tgaggtggat taaaccaaac ccagctacgc aaaatcttag catactcctc 120
 aattaccac ataggatgaa taatagcagt tctaccgtac aaccctaaca taaccattct 180
 taatttaact atttatatta tcctaactac taccgcatcc ctactactca acttaaactc 240
 cagcaccacg accctactac tatntcgac 270

<210> 270
 <211> 368
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(368)
 <223> n = A,T,C or G

<400> 270
 ctgaatcatg aataacacta tataatagag tntaaggaac acaagcatta gatgtgatcc 60
 ttgccccata cccttagatt atgtcagact aaagctgaca attctgccag gctctgaacc 120
 cctagtgcc ccaacccaaa tcttggaagc aaagaatatg ccctgtcata caactttgta 180
 caagttgtag taaaacaaag cctaagtttt ctcatctttc tacagcaaatt ggtcagttat 240
 ttaataaaca ctaaaatgct cctaagaatc cattttgagt ttgtttacca aacacattgt 300
 gcaagaactg actacacaaa aagttccttt gaaatttggt ccacaaattc acttaagggt 360
 ggaaattt 368

<210> 271
<211> 313
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(313)
<223> n = A,T,C or G

<400> 271
aaatttatat aaaactctgt acatgttcac tttattattg cataaacagc ataactctca 60
agacaanngt ttgcaaacac atgtccaatt caggaaaaaa aatttcacgt ttctcgtctg 120
gcttttttct tcttttttat ttgtttggga gattccccagc tagtttcaga ctgggtctgt 180
gaaggaggca cactattttg cttgggtattt gacttggatt tatctgtctc ttgtagtatt 240
ggcggcactt gggaagagct cttgtcagaa tcactttttg ataagattac agatggctcg 300
gtagaagtag cag 313

<210> 272
<211> 462
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(462)
<223> n = A,T,C or G

<400> 272
aaaaaacatt tattttaata agactattgc naacacatta aaaaaactaa atagtaatat 60
tacaaaatct atatacttgc acatttagta ttgtcaatg tgccagaggt tttcttcatg 120
aaatttgact tctttgaagt gaaggctttt ttctatcatc tcttatagct ctgactgaat 180
aagtcttaat gctttcttca tgttttctat caataggggt aaatccccag gctcatatgt 240
gtacaatctg ttagagtatc ttccagctat gtcagctcta actgttaaag aagggtctac 300
aaacatgatt ctaggcacat attgcccatc aggtgataaa ttcttatcag tggtttcatg 360
cataaggttt agcatgatga acttattctg agccatttct tgtatttctt cattttgggc 420
aaatactttc tttagtgtt gagagtattg acaatcctcc ag 462

<210> 273
<211> 282
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(282)
<223> n = A,T,C or G

<400> 273
ctgatcaaag catgggatat tttaatagtn ttatacataa tatttttaca tagaaaactt 60
tacatnncat ttcatttat ataattctgc ttattctttc aaaaatttat acatccattg 120
ggcaaggaat ggttttcatt aaattaccaa tattaaatgc acttaatcat tgtgtatagg 180
ttaaaccaaa gtaactatta actaactttt aggcatttta aggaggtaaa acatacattt 240
tacacataag tatttgatgc aaatatgcag ataaaatttt tt 282

<210> 274
<211> 125
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(125)
<223> n = A,T,C or G

<400> 274
cagccctaga cctcaactac ctaaccaacn ttnccttaaaa taaaatcccc actatgcaca 60
ttnaatcnct ccaacatact cggattctac cctagcatca cacaccgcac aatccccctat 120
ctagg 125

<210> 275
<211> 528
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(528)
<223> n = A,T,C or G

<400> 275
aaagctgtgg aaaagcttta ttatagattt ttntacagaa ttaaaaaagt tcaaacaata 60
ataagccngg aaccacaaat aattaaaagg aaacacagca atcccataaa caagcattct 120
ggcatctgtt agaaattttc cctcaaatta tgaaatgtag ctctccatgc tttccaatga 180
ttgttataat acccacaat atctgtgatt tcagtggaaat actttaacaa aagttttctt 240
tttaaggcat gatcctgatt cattttttct tcaatatctc agtcatttca ggaactacct 300
taaataaatc tgcaactatt ccataatctg ccacttggaa aattggagct tctgggtctt 360
tattaattgc cacaattgtc ttgctgtctt tcacccagc taaatgttgg atggctccag 420
atattccaac agcaatataa agttctggtg ctactatttt tcccgtctgn ccaacttgca 480
tgtcattggg aacaaagcca gcatcaacag cagcacggga agcaccaa 528

<210> 276
<211> 420
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(420)
<223> n = A,T,C or G

<400> 276
aaatgtcttg tttcccagat ttcaggaaan tttttttctt ttaagctatc cacagcttac 60
agaaacctga taaaatatac ttttgtgaac aaaaattgag acattttacat tttctcccta 120
tgtggtcgct ccagacttgg gaaactattc atgaatattt atattgtatg gtaatatagt 180
tattgcacaa gttcaataaa aatctgctct ttgtatgaca gaatacattt gaaaacattg 240
gttatattac caagactttg actagaatgt cgtatttgag gatataaacc cataggtaat 300
aaaccacag gtactacaaa caaagtctga agtcagcctt ggtttggtt cctagtgtca 360
attaaacttc taaaagtta atctgagatt ccttataaaa acttccagca aagcaacttt 420

<210> 277
 <211> 668
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(668)
 <223> n = A,T,C or G

<400> 277
 ccagggtggc tctgatatag cagccctggg ntattttcga tatttcagga agactggcag 60
 atngcaccag accctgaatt cttctagctc ctccaatccc attttatccc atggaaccac 120
 taaaaacaag gtctgtctctg ctctgaagc cctatatgct ggagatggac aactcaatga 180
 aaattttaaag ggaaaaccct caggcctgag gtgtgtgcca ctacagagact tcacctaact 240
 agagacaggc aaactgcaaa ccatggtgag aaattgacga cttcacacta tggacagctt 300
 ttcccaagat gtcaaaaacaa gactcctcat catgataagg ctcttaccac cttttaattt 360
 gtcccttgctt atgcctgcct ctttcgcttg gcaggatgat gctgtcatta gtatttcaca 420
 agaagtagct tcagagggta acttaacaga gtatcagatc tatcttgtca atcccaacgt 480
 ttacataaaa ataagagatc ctttagtgca cccagtgact gacattagca gcattctttaa 540
 cacagccgtg tgttcaaatg tacagnggtc cttttcagag ttggacttct agactcacct 600
 gttctcactc cctgttttaa ttcaaccag ccatgcaatg ccaaataata gaaattgctc 660
 cctaccag 668

<210> 278
 <211> 202
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(202)
 <223> n = A,T,C or G

<400> 278
 aaattggtat cgacggcaac caggggaagn tnctaaactc ctaatctatt ctggatccaa 60
 ttngcnaagt ggggtcccat caagggttcag tggcagtgga tctgggacag atttcactct 120
 caccatcagc agtctgcaac ccgaagattt tgcaacttac tactgtcaac agagttacat 180
 gtccccgtac acttttggac cc 202

<210> 279
 <211> 694
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(694)
 <223> n = A,T,C or G

<400> 279
 ctgtacttgg acaaaataag ttaattctat ttggttgccc attaaagttt tatgtggcta 60
 tgnaccact ggagctaaaa attggctttt aactgtttcc aaatcagaac tagcagagga 120
 gagaagtaaa taaagccaat ggcactccct tcagaggctc aaaatgggta gattttgatg 180

cagatttaac	cttagcgagt	ttcagtcagt	ccatttagat	gatcctgtag	gttcatacaa	240
atacactgaa	ccgttggttt	aacttctctt	ccttcctcaa	agtttatgat	aaagagactc	300
atccctgtat	tgggagtgac	tgacataagt	tcagatctgc	tcagagtggc	tggttaaggaa	360
cacttaaggt	cagtcagaaa	ataatcaaac	agacttctca	tgtaaagcacc	gtgactcaca	420
actaagacac	tggctgctaa	tcctggaata	ccgctgtctg	aattaacttt	agagctgtga	480
ttttttccta	aaggaaatat	ctctgccaaa	gaagtttcca	gacagntgct	tgggagatcc	540
ttggggaaaa	ctgggtctttt	tgatccggtt	ctttcangan	taggtngaca	aaagaaatnc	600
aaaaaagnct	atcccacgcn	tttntcacct	gggccccagcg	gnnctcctcc	nggggggggn	660
aaacacangg	gactcttccc	ngggctngct	tnng			694

<210> 280
 <211> 441
 <212> DNA
 <213> Homo sapien

<400> 280						
aaaaaacttc	catgcaactt	ctggtttatt	gtttggcaac	tccacatgat	aaaaaaataa	60
aaacagccca	accgagtttc	ggaatttaagt	actcttctag	taagtgattc	aaacttgtaa	120
tatttgccac	aggactgact	tatttattta	ctagctagaa	gctcttaagt	tcacttgttt	180
atcagggcat	atacagaagg	gtttgttaaa	actcgatgtt	aactttacaa	ctttctgacc	240
tgggtgcatga	attctcaagt	actgtatttc	actgtgttgg	tgtgtctgat	gsaaatttcg	300
aggtgggtccc	acaaaaatat	tttatgtagt	gtgccttcaa	agagaaccat	ttatttctct	360
tcacttatcg	tcccacaaaq	tcacatttgg	tggtygtcag	ccaagtcgca	tctgggtctag	420
ttttactctt	gtcccaattt	t				441

<210> 281
 <211> 398
 <212> DNA
 <213> Homo sapien

<400> 281						
aaatttggtta	ggtctgaaga	atctaaaact	gttaatttaa	cccttaactt	gtgcctagaa	60
actacagcac	atataaaaata	tgtaaacacc	agcctgttgc	tgtacttttc	tgcttatttt	120
acagcctcaa	atattttctca	ttatcttgtc	acttagttct	tcagtgttct	ccttctgact	180
tttaataatg	gtaataggaa	aacaaaaccc	aaagcttttc	agaacttcag	tgtgaggttt	240
cctattttga	caagtttaact	tgtaaatact	caggttttac	gatgtataat	ttacctaata	300
gaccaaacta	actcatggag	atattttgaa	ctattattta	ggtacaaaact	ttataaagaa	360
tgtagtatg	tcataaaaata	taacattaca	gcttattt			398

<210> 282
 <211> 226
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(226)
 <223> n = A,T,C or G

<400> 282						
aaaacaatat	tctctttttg	aaaatagtat	naacaggcca	tgcataaat	gtacagtgtg	60
ttacnccaat	atgtaaagat	tcttcaaggt	aacaaggggt	tgggttttga	aataaacatc	120
tggatcttat	agaccgttca	tacaatgggt	ttagcaagtt	catagtaaga	caaacaagtc	180
ctatcttttt	ttttggctgg	gggtgggggcg	cccaggccga	ggctgg		226

<210> 283
 <211> 358
 <212> DNA
 <213> Homo sapien

<400> 283
 aaacaaaaat actcaagatc atttatatatt ttttgagag aaaactgtcc taatttagaa 60
 tttccctcaa atctgagga cttttaagaa atgctaacag atttttctgg aggaaattta 120
 gacaaaacaa tgtcatttag tagaatattt cagtatttaa gtggaatttc agtatactgt 180
 actatccttt ataagtcatt aaaataatgt ttcacaaat gggttaaagg accactgggt 240
 tcttagagaa atgttttttag gcttaattca ttcaattgtc aagtacactt agtccttaata 300
 cactcaggtt tgaacagatt attctgaata ttaaaattta atccattctt aatatttt 358

<210> 284
 <211> 288
 <212> DNA
 <213> Homo sapien

<400> 284
 aaaacttttg ttaagaaaaa ctgccagttt gtgcttttga aatgtctgtt ttgacatcat 60
 agtctagtaa aattttgaca gtgcatatgt actgttacta aaagctttat atgaaattat 120
 taatgtgaag tttttcattt ataattcaag gaaggatttc ctgaaaacat ttcaagggat 180
 ttatgtctac atatttgtgt gtgtgtgtgt gtatataat gtaatatgca tacacagatg 240
 catatgtgta tatataatga aatttatgtt gctgggtattt tgcatttt 288

<210> 285
 <211> 629
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (629)
 <223> n = A,T,C or G

<400> 285
 cctaaaagca gccaccaatt aacaaagcgt ncanntcaa caccactac ctaaaaaatc 60
 ccaaacatat aactgaactc ctcacacca attggacca tctatcacc tatanaagaa 120
 ctaatgttag tataagtaac atgaaaacat tctcctctgc ataagcctgc gtcagattaa 180
 aacactgaac tgacaattaa cagcccaata tctacaatca accaacaagt cattattacc 240
 ctactgtca acccaacaca ggcatgtca taaggaaagg ctaaaaaaag taaaagggaac 300
 tcggcaaata ttaccccgcc tgtttaccaa aaacatcacc tctagcatca ccagtattag 360
 aggcaccgcc tgcccagtga cacatgttta acggccgcgg taccctaacc gtgcaaagggt 420
 agcataatca cttgntcctt aattagggac ctgtatgaat ggcttcacga gggttcagct 480
 gtctcttact ttttaaccagt gaaattgacc tgcccgtgaa gaggcnggca tgacacagca 540
 agacgagaag accctatgga gctttaattt attaattgaa acagnaccta acaaacccca 600
 caggtcctaa acttacccaa accctggca 629

<210> 286
 <211> 485
 <212> DNA
 <213> Homo sapien

<400> 286
 aaatgtactt gctcagctca actgcatttc agttgtatta tagtccagtt cttatcaaca 60

ttaaaaccta	tagcaatcat	ttcaaactcta	ttctgcaaact	tgtataagaa	taaagttaga	120
attaacaatt	ttatttttga	caacagtggg	atcttctgtc	atggataatg	tgcttgagtc	180
cctataatct	atagacatgt	gatagcaaaa	gaaacaaaca	aaagccagga	aaacactcat	240
tttcgccttg	aatatgtaaa	tgggattaat	tttgcctgt	gccttatgtg	gaaaggaact	300
tctttggttt	tccttttttg	ttctgggtgga	agcatgtgca	ggagacatat	catccaaaca	360
taaaccatta	aaatgtttgt	ggtttgcttg	gctgtaattt	tcaaagtagt	taattgagga	420
caaagggtaa	tgagaagtgt	atagctttgg	tttgctgagt	cttggtttta	gtggccttga	480
tattt						485

<210> 287

<211> 340

<212> DNA

<213> Homo sapien

<400> 287

cctggagtcc	aataaccacc	ccctcatacc	acaccctgtg	catacaccag	ccaagccttt	60
cctgggtctgg	gaagggaaga	gaaaaaagac	gcaggccacc	tgggggttct	gcagtctttg	120
gtcagtcacg	ccttctatct	tagctgcctt	tggcttccgc	agtgtaaacc	ttgcctgccc	180
ggaggcagga	ggcccagctg	gacctccgag	ggccatgagc	aggcagcagc	catcttgccc	240
tcaagctttg	ctttcccttg	agtcctctc	tccctcggc	tctagccaga	ggtgtagcct	300
gcagatctag	gaagagaaga	gctggggagg	aggatgaagg			340

<210> 288

<211> 290

<212> DNA

<213> Homo sapien

<400> 288

aaacagtctc	tcctcggtgt	tctccttgtc	aaactgttca	tcccagtttc	ctctgaaata	60
gacagcattc	accagaacca	gccttgtcaa	tggatccact	gagcccggag	agagcaactc	120
cgcaatttta	ccttctgtct	tttcagctac	ccaggtgttt	atgtgttttc	tggacttctc	180
tacggcgctg	ataaagtcaa	gctcctccat	ctctgcttgg	tagaattttt	ggcaggaatc	240
tctaaaagat	gagaggaaat	cacaagactt	ttccccaag	agcctgttgg		290

<210> 289

<211> 404

<212> DNA

<213> Homo sapien

<400> 289

ccaccacgc	ttaggttccc	atcacactga	tgactccggg	tttggcgagc	acaggagcgc	60
aaaccttttc	acattctttc	tgtgatccaa	atctgttttc	gtttccacca	caacctccat	120
accagaatct	tgacagctt	ttggtgtttg	gatcatagta	ccattttaat	atgaaatccc	180
tgcaagtcc	tctgtctttc	ggcaacttgc	atatatctgt	ttcagtgaga	gccaatgggt	240
ctgtgtcac	cattagattg	atggttgaa	tagaagctga	ccttgctggc	tgtggaggtg	300
ggggctgaga	ttcttttga	ctgaaacttc	cgtggtaggt	ggctctgacc	tgagacctca	360
ggtagcagac	cacagccaca	tggtatgtct	gcccagcgag	cagg		404

<210> 290

<211> 384

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (384)

<223> n = A,T,C or G

<400> 290

ccaggcgctc	cttgtcggca	tcaggaggag	tggccttgaa	ctgctcatgg	gctgtgggtca	60
gtccctggat	ctcctcaatg	gtgtgcacaa	tgaagggtgc	ctgcagggtcc	tccatggccc	120
cctccatcca	gttgttgaag	gggtgcagccc	gcttggcata	ctccaagtac	agctgggtcaa	180
tgggtctccag	cagtttctcg	gtccgctcca	gagcttccct	tcgcttctga	gttagggccc	240
ccagattgtc	ccactgggtca	cagatctttt	ggcaacgggc	gttgacactg	ggtaggtcat	300
aatantccag	ctcattgagc	tcctgtgcga	tggcggcaat	ctgctccaca	cggctctggg	360
gggcagccag	gccactctcg	aagg				384

<210> 291

<211> 278

<212> DNA

<213> Homo sapien

<400> 291

aaagtttatt	tttactat	ctttatcact	ttattgtatc	atcaccattg	gtttcataat	60
gtaaatacta	tatgttgaac	aaattaaatg	tcaaaat	ttattaccat	agtccatgtt	120
aatagtgggg	ctttcaggtg	tttagagatt	ttttttgttg	ttgttaacat	tcattgcaaa	180
agtactagat	gggtgtataac	tctagagttg	aattttaagg	gattccctaa	tatgtatact	240
atctttttat	ctgaagtaat	aaataaacia	tgatcttg			278

<210> 292

<211> 177

<212> DNA

<213> Homo sapien

<400> 292

ccttggcccc	gtcattcttg	tccagtttga	taggttcag	aaattcggtg	tacagctcca	60
cctccgtttc	ctgcttaagt	gcattccgtg	caatcgctg	gaacgcctgc	tccacgttga	120
tggcctcctt	ggcactgggtc	tcaaagtagg	gaatgttggt	tttgctgtag	caccagg	177

<210> 293

<211> 403

<212> DNA

<213> Homo sapien

<400> 293

aaaaagaagg	acttaggggtg	tcgttttcac	atatgacaat	gttgcat	ttatgatgcagtt	60
tcaagtagca	aaacgttgaa	ttgatgatgc	agttttcata	tatcgagatg	ttcgctcgtg	120
cagtactgtt	ggttaaatga	caatttatgt	ggattttgca	tgtaatacac	agtgagacac	180
agtaatttta	tctaaattac	agtgcagttt	agttaatcta	ttataactga	ctcagtgctt	240
gccttttaaat	ataaatgata	tggtgaaaac	ttaaggaagc	aaatgctaca	tatatgcaat	300
ataaaatagt	aatgtgatgc	tgatgctgtt	aaccaaagg	cagaataaat	aagcaaaatg	360
ccaaaagggtg	tcttaattga	aatgaaaatt	taattttgtt	ttt		403

<210> 294

<211> 305

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(305)

<223> n = A,T,C or G

<400> 294

aaagcaatct	ggcatgggtgt	cctgtagtga	agcagaggat	cataacataa	gtaaactctc	60
tatgggtgga	agttggagag	aaggacattt	tggctttgtg	catgaaaaga	ctctccagat	120
agaaacagat	tctgcccata	agtgaataaa	aatgctttgt	gggggtaatg	agtgacttat	180
agtattcagg	cagatgttac	ataactgcta	attaagtttc	cctggattga	ntttanncaa	240
anaattgaaa	gtngattttg	gtcangtgtc	agnaaactac	tgcctataaa	cccatatcnt	300
accca						305

<210> 295

<211> 397

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(397)

<223> n = A,T,C or G

<400> 295

cctatctggt	tggccttttt	gaagacacca	acctgtgtgc	tatccatgcc	aaacgtgtaa	60
caattatgcc	aaaagacatc	cagctagcac	gcrccatacg	tggagaacgt	gcttaagaat	120
ccactatgat	gggaaacatt	tcattcccaa	aaaaaaaaaa	aaaaaaaaat	t!ctcttctt	180
cctgttattg	gtagttctga	acgttagata	ttttttttcc	atgggggtcaa	aaggtacctt	240
agtatatgat	tgccgagtgg	aaaaataggg	gacagaaatc	aggtattggc	agtttttcca	300
tttncatttg	tgggngaatt	tttaataata	atgcggagac	gtaaagcatt	aatgcnagtt	360
aaaatgtttc	agtgaacaag	tttcagcggt	tcaactt			397

<210> 296

<211> 447

<212> DNA

<213> Homo sapien

<400> 296

ccatcctcga	tgttgaagtt	gtcgtggggc	ccgaagacgt	tggtggggat	gacagcgggt	60
aaggtgcagc	cgtactgctg	gaagtaggcc	ctgttctgca	cgtcgatcat	cctcttggca	120
tacgagtacc	caaaattgct	gttgtgggga	ggcccattgt	ggatcatggt	ctcatctatc	180
gggtaggctg	tcttgtcagg	gaagatacag	gtggacaggc	aggacaccac	cttgcggggc	240
cccacctcga	aggccgagtg	caggacgttg	tcgttcatgt	gcacgttttt	cctccagaag	300
tccaaattgt	atttgatatt	ccggaacagg	ccccccacca	ttgcagcaag	atggatgacg	360
tgtgtgagtt	ggaccttctc	aaacaggggc	cgggctctgt	ctgtatccgt	gagatcggcg	420
tctttagagg	agacaaacac	ccagtcc				447

<210> 297

<211> 681

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(681)

<223> n = A,T,C or G

<400> 297

aaataacagc	atgtaaaata	ttaaaataca	agctttcaaa	aataaataca	taaataagta	60
gaaccctcgt	aagaaatagt	caaacacatt	aagtcctttc	cagctgtccc	tagaaagctg	120
ctgttctctt	tttcattttc	agctctggta	agggcaggga	ccaccctgca	ggaagtgtca	180
atgatacgct	gataagcttc	ttacttctct	cctgtcagtt	ggtgctcccc	ctgtgatgag	240
aaaaggggta	ctgttgccagg	tgctaaggaa	ggctgctctt	ctgtcactct	gaagttgctt	300
ggagggatgt	ccccatgcag	actctctccc	agccctccac	tcaggggaagg	tctgtctgta	360
cccactgcct	tctatagcag	aaaacttgca	ctcctgaatg	cttttttttt	ttttcaagaa	420
agaagnggct	gnggactcaa	ctagattctt	ggtttgaaaa	agccaaaaca	tattgggtcac	480
tgattgtcac	attgggttag	aatgtccat	tcatgatctc	ccttaagctg	cacacaaccc	540
tatgaaataa	ctaccattat	ctaccctatt	ttgctaagac	tcaaagagat	taaataatgt	600
tgacagggat	cttagccttg	aactcactga	aggngttact	gcaaagttct	gctcttcacc	660
aagaaggnit	acaggccaaa	g				681

<210> 298

<211> 353

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(353)

<223> n = A,T,C or G

<400> 298

cctggcctta	gaccagacat	ctgaagaagg	ctccaggcag	ggaaaggaaa	ggagaggcca	60
gccccacnct	gnccccccc	tgccccacg	tctccagcaa	cacaaggcgg	ccagtggacc	120
gtgaaccatt	tatttccaaa	ctataaagaa	acctgctctc	tgagaaaana	cactgcccag	180
gngatgaagc	tccagccctt	ggaggtccaa	aaccagtcct	aaactcagtc	cctttagaaa	240
gctgctgtgc	cttggaatg	annntcggnt	gtcanagcct	gggaagtggg	gggaagaacc	300
agcccactcc	cctctcctgc	tgcgattcca	gcgcncgttg	ggnccagatc	tgg	353

<210> 299

<211> 560

<212> DNA

<213> Homo sapien

<400> 299

aaagttcaag	gactaacctt	atattatttg	gaaaggggag	gaggaaggaa	atgatatggg	60
accagacac	tgggctaggc	tgcaacttta	tctcatttaa	tactcccagc	tgtcatgtga	120
gaaagaaagc	aggctaggca	tgtgaaatca	ctttcatgga	ttattaatgg	atttaagagg	180
gcacaaatca	gctcaactca	agatttcata	atcattttta	gtatttagat	tgtgcctcaa	240
agttgtagta	cctcacata	cctccactgg	tttctgttg	taaaaacctt	cagtgaagttt	300
gaccattgtg	ctcttggtct	ttgggctgga	gtaccgtggg	gagggagtaa	acactagaag	360
tcttttagtac	aaaactgctc	tagggacacc	tggtgattcc	tacacaagtg	atgtttatat	420
ttctcataaa	gagtcttccc	tatccaagg	tcttcatgat	gccagtagcc	atatatgata	480
aattatgttc	agtgataact	tagttatcag	aatcagctc	agtggctctt	cccgccatga	540
ttcacatttg	atgagttttt					560

<210> 300

<211> 165

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature
 <222> (1)...(165)
 <223> n = A,T,C or G

<400> 300
 aaaaactaca taggggtgtg tgtgtgtgtg tatgtttatt ttatacacac atatttgtat 60
 attctaatat attactaagg caattttaat gaattaccat gtatataaaa aaatatctgn 120
 cacttggcac acaggtttgt atgtatgtgt atatatatat gtatg 165

<210> 301
 <211> 438
 <212> DNA
 <213> Homo sapien

<400> 301
 aaaatatatg tatttaaaaa caaaaagcaa cagtaatcta tgtgtttctg taacaaattg 60
 ggatctgtct tggcattaaa ccacatcatg gaccaaatgt gccatactaa tgatgagcat 120
 ttagcacaat ttgagactga aatttagtac actatgttct aggtcagtct aacagtttgc 180
 ctgctgtatt tatagtaacc attttccttt ggactgttca agcaaaaaag gtaactaact 240
 gcttcattct cttttgcgct tttttgaaa ttttagttat agtgtttaac tggcatggat 300
 taatagagtt ggagttttat ttttaagaaa aattcacaag ctaactcca ctaatccatt 360
 atcctttatt ttattgaaat gtataattaa cttactgaa gaaaagggtc ttcttgggag 420
 tatgttgtca taacattt 438

<210> 302
 <211> 172
 <212> DNA
 <213> Homo sapien

<400> 302
 ccaaaacagg agtcttgggt gatatcatca tgagaccag ctgtgctcct ggatgggttt 60
 accacaagtc caattgctat ggtaacttca ggaagctgag gaactgggtc gatgccgagc 120
 tcgagtgtca gtcttacgga aacggagccc acctggcatc tatcctgagt tt 172

<210> 303
 <211> 552
 <212> DNA
 <213> Homo sapien

<400> 303
 ccagcctgtt gcaggctgtt tcgtagcggg cgtcggctgc ggacttccct tcccgggtct 60
 ggatcttttt atcctaccag atgagaaagg gaatgagtga atggagtgc cccgcaccct 120
 gtcactttcc tgagacatga ctgccaggaa gaagagctgc tctggtctcc atcagggtgt 180
 gcaggacaaa ctgaccagtg agtcagtagg cagagttcac actgaaaaag ggcacaaggg 240
 ctgtcccaca atgggaggaa atgggtctc agaacttcta cttctctgaa aactaagaca 300
 caattgggac aaccaccacc cccgtgtgag atttctcacc tcgagacagg acaagatgaa 360
 gttcacggct tcttctgggg taaagacctt gaagagccca tcacaggcca acaaaatgaa 420
 cctacaacac caggagagaa tataaacggg ttttaggccc aaccaaaaaa taaaaaataa 480
 aaaaagggcc tggagatgga gataaaataa atatttgtcc aactattcaa aggctaagg 540
 ttttttttct tt 552

<210> 304
 <211> 601
 <212> DNA
 <213> Homo sapien

<400> 304

cctttgattc	ttggtagtag	attgcatgta	aaatgtttat	aagaagctac	ttttccttca	60
tgggaagaaa	ttccacatg	agattcataa	attcttagac	tccgtggctt	ctttgggtccg	120
gaatgcttaa	actcatatga	gtgttctgga	tcccagtgta	tccaatcata	attcacatta	180
tcaccttcac	gaaccacata	ctttgccac	ggtgaaatac	gatacaagat	ctctccgctt	240
ttactagtaa	taactacctt	taatttggat	ccatgaggca	cgagtacaga	tttattctgc	300
tttgggtggga	tatacagctc	ccattttcca	taatccagtt	ttttgtatgg	gtacgaaaat	360
ggattccaac	cattaaaatc	tccagtaaga	aaaactcctt	ctgctcccgg	ggcccattct	420
ttgcagtata	aaccaccatc	agcacatctg	tggacgccaa	atgattcata	gcctctggaa	480
aacttatcaa	taccaccttc	attttctcca	atgttcttca	aaatttggct	aaactgctta	540
tacctgcgct	ggaagtccac	ggcgtagggc	ttcaagtacc	ggtcgatctc	caggagtctg	600
g						601

<210> 305

<211> 401

<212> DNA

<213> Homo sapien

<400> 305

aaataacagc	atgtaaaata	ttaaaatata	agctttcaaa	aataaatata	taaataagta	60
gaaccctcgt	aagaaatagt	caaacacatt	aagtcctttc	cagctgtccc	tagaaagctg	120
ctgttctctt	tttcattttc	agctctggta	agggcagggg	ccaccctgca	ggaagtgtca	180
atgatacgct	gataagcttc	ttacttctct	cctgtcagtt	gggtgtcccc	ctgtgatgag	240
aaaaggggta	ctgttgcagg	tgctaaggaa	ggctgtctct	ctgtcactct	gaagtgtgctt	300
ggaggggatgt	ccccatgcag	actctctccc	agccctccac	tcagggaagg	tctgtctgta	360
cccactgcct	tctatagcag	aaaacttgca	ctcctgaatg	c		401

<210> 306

<211> 313

<212> DNA

<213> Homo sapien.

<400> 306

aaactgacta	tggattcctt	gaaggtctgg	cagttgttga	tgatggcgat	catgtactga	60
acgtagcagt	gaggggtgctg	ccgattcctc	aggtgctctt	ctttatacag	ctgcgcttca	120
tctttatatc	tgaggacaga	caggcttcgg	tcagacagca	ctaagggcaa	catggagctg	180
tttcaaatgc	cacgctgacg	tcacgcctgg	cctgaaatth	cacatcacta	acatctgacc	240
ggatgagcct	ctaaaaataa	aacaatcttt	agacgatcca	gactaatgga	aggacagaga	300
ggttgattac	ttt					313

<210> 307

<211> 366

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(366)

<223> n = A,T,C or G

<400> 307

aaagatgctg	ntaatgaaca	ttacggacaa	ttcatgggtg	ggctagttgg	taacacttca	60
gctgattttt	cttatgagat	ggaaaaaaaa	aatcagccaa	gtaagggcac	atcttcactt	120
catttataag	tcagcatcca	aggtaaaaaga	attctctggt	ggacttgaca	tcactcccat	180

cctctgatac	tcgcctactc	tcttctcaaa	gaagttagnt	ctttccttcc	antgaaatat	240
tctcataaaa	gtcaaatggg	ttctctactc	tgaaaacctt	gctaaaaccc	aattccagca	300
taagtttgtc	tgncacaaac	ncaatgnatt	gcttcattaa	antgcaattc	atcccaatga	360
gcttcc						366

<210> 308

<211> 534

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(534)

<223> n = A,T,C or G

<400> 308

ccagctatca	gctgatcgtc	ttctgtctgg	acgctcgtec	tgcttctgac	atcaaaatct	60
tctgtctcaa	agtcagagtc	atccaactcc	tcaggggtcc	ttatcatcag	cactgctttc	120
ctgatgtccc	ggatgccatc	atataccagg	cggaagcat	cgataaactc	attctcatcc	180
atgggctggg	caggggtccga	gctgagggct	tccacggctg	cttctacttg	ctcagtaaaa	240
cgtggcatga	ctgtgttgga	gagcagctta	gtggcttcca	gaaccttctc	tgtgtagact	300
cctggctcat	agtcgtccat	ctctgagggtg	actacgtgaa	tgaccggggc	tgcccggcct	360
cgaattgcac	cagctgtgcg	gccaggccat	ccacatcctt	ctcttgagga	gcaatgacac	420
atttggtcac	atcttccaaa	atgtgattct	ctgagacagc	caagaagtca	tcaatggaag	480
taatgncatc	gacagcatct	gtgagaacac	cgacttggtt	ttccattgnt	cttt	534

<210> 309

<211> 164

<212> DNA

<213> Homo sapien

<400> 309

catactcctt	acactattcc	tcatcaccca	actaaaaata	ttaaacacaa	actaccacct	60
acctccctca	ccaaagccca	taaaaataaa	aaattataac	aaaccctgag	aacccaaatg	120
aacgaaaatc	tgttcgcttc	attcattgcc	cccacaatcc	tagg		164

<210> 310

<211> 131

<212> DNA

<213> Homo sapien

<400> 310

aaaaatcatt	tatctttcgg	tgcttcaaca	tgatgccaaa	caaaaatcta	ctgaataaaa	60
atagcaagga	agggaaatcaa	acatttataa	gatataattta	ttatttttct	gaccaaaagtg	120
caatgatttt	t					131

<210> 311

<211> 626

<212> DNA

<213> Homo sapien

<400> 311

cctatgtgcg	ccagtttcag	gtcatcgaca	accagaacct	cctcttcgag	ctctcctaca	60
agctggaggc	aaacagtcag	tgagagtggg	ggctccagtc	agaccgcgca	gatccttggg	120
cacctggcac	tcaagcatt	tgacgatgt	ctcaaccaac	atctgacatc	tttcccgtgg	180

agcaacttcc	tgctccacgg	gaaagaggtc	gatggattta	cccctggacc	cataagtctg	240
ttcatcctgc	tgaagtcccc	tccccattgc	tccttcaagc	caaaactaca	ctttgctggg	300
tcctgtcccc	tctgagaaa	gggatagaaa	gctccttcct	ctatgtcctc	ccatcgagat	360
ctgttctggg	gatggagctt	ccaacttcct	cttgccagcag	gaaagaatgc	tgctcacctc	420
tctgtcttgc	agagtgggat	tgtgggaggg	attggcagcc	ttcttctcca	ccacctgtcc	480
agcttctctc	tggtcagggc	tgggaccccc	aggaatatta	tgttgccgtg	tgtgtgtgtg	540
tgtgtgtgtg	tcttctttta	gggagcagga	gtgcatctgg	taattgaggg	tagatgttgt	600
gtgtgctggg	gaggggtcct	tctgtt				626

<210> 312

<211> 616

<212> DNA

<213> Homo sapien

<400> 312

aaaccaaaga	aattaagaaa	aaagacttca	ttgcttgaat	gacgcgaaca	gctgtctgag	60
tcacctagac	tttaacacca	cctggggccc	tgggaatgac	gctgacgaga	gatctgcaca	120
tagtaggcgt	gggctccaaa	tgtgctcatc	agctgacttc	acatcctcac	aagtcagcct	180
cagatatgac	ccaaggata	cgtaccatct	cttcttgaaa	cagcgtgtca	aattatatat	240
atgtatgcaa	aaaagagtaa	tgtactaagc	aaaccaagtt	tcgtcttttt	cttctgaatc	300
tggttttaat	gtgacctgtc	atccccatct	ttcgaattta	tgagctccat	cttctctaga	360
ctgttaactt	cttgaggaaa	acatgctatt	ttaccacctt	tcactgctga	atccctagcc	420
cttaagcaca	gtctctggca	cagaataaat	acgaaatgaa	tgagtgaatg	aatggatgga	480
tgggtgaaga	gaaaaggcaa	tgcacaagat	ttacctatca	aaatccacca	atggtcctta	540
aaaatggttt	tgtcagtaga	gatgctgaat	atattcatat	aatacattta	tttcataact	600
attaagaatt	ctagtg					616

<210> 313

<211> 553

<212> DNA

<213> Homo sapien

<400> 313

aaaaaatggc	agcattgtac	ttgaatcaga	aagcttactg	ggatttcctc	atcgaaagta	60
gagattgcag	ctaactctag	taccttttgt	tagtaattac	ttaaggcaca	gtgcaaagtt	120
gaaggactgt	tttggtaaca	actcaagcca	gctacatgta	tgcttgccct	ggtatccttg	180
ctagagcaca	tgcgggtata	ataccgtatt	atacacaaca	aggccaccct	ggtgtatctg	240
tgttacaatt	aaacatcagt	cccagaaagt	gaaccctagt	catttattat	aggtgccac	300
ctctgacttg	gaacaaaatg	ccactccatt	catgttcatt	tttgcctggg	agaggattta	360
tttcctaaaa	gattctgaaa	gccaacaaat	caatgtagtt	cttcatagag	aacttaagag	420
taaggctcaa	aatggcctca	aaatgggctt	cttggatgac	ttccaacagt	gactggcctt	480
ctcaacactg	cagatgtctg	agcactacca	taacctaacg	aagtgaggaa	ggaggaggca	540
aattggtatt	ttt					553

<210> 314

<211> 330

<212> DNA

<213> Homo sapien

<400> 314

ccagcgactc	cagcgggtggc	agcaggcagt	gcacgtactc	tgggcctccc	accagggtag	60
tgaagggttc	cagctgttct	gccagggccca	ggaggacctc	atcttcatca	tagatgggat	120
ctgtaaggaa	aggcagaagc	tcacttcggg	tcctttcaac	cccaagggcc	aaggcgatgg	180
tggacagctt	cttgatgctg	ttgaggcgaa	gctgaacgtc	ctcattgcgg	agttcgtcta	240
tgagcaccgc	gatgggggtac	agcgagtcgt	cgccgtcggc	cgccgccatc	ttggctccgt	300

ccctttcctg tcagactgcg gccagcgctg

330

<210> 315

<211> 380

<212> DNA

<213> Homo sapien

<400> 315

aaaaatgaca ttgcgttttag cttattgtaa gaggttgaac ttttgtattt tgtaactatc	60
tttaagccct tcagtttata attcatataa aatgcctttt gtatttataa taatcctatt	120
ttaatcagtg catgaaattt gcttttttaa agttcatttg aatgattatt ccttccctct	180
aaagaaatga ttttggtaat gttgagaggt accttaccac aaatcctaac tgtaagtgtg	240
ttcatgggta ttttcaaaag aattatgact cttcccaaaa agaatcctaa aaaacttgta	300
ataaacctat aaagctgatt tgcattttta caaaattttg aatagcaaat ataggcaact	360
catatatgta tataattttt	380

<210> 316

<211> 222

<212> DNA

<213> Homo sapien

<400> 316

aaactacaga gggttttcca gctattattt cctttagttt craaaaagtaa cgacttatat	60
taatgtttta taaaagatag tgatgaaaaa aaggtaatgc tgaaataaag gcgcttttag	120
aaatatttta ggacaacata aggtattaat attggaaaaa aactgtacat attttcaagc	180
acaacactga aatattgcag cagtgtttta ctgaattgtt tt	222

<210> 317

<211> 490

<212> DNA

<213> Homo sapien

<400> 317

ccttgaatga gcgtggagag cgattaggcc gagcagagga gaagacagaa gacctgaaga	60
acagcgccca gcagtttgca gaaactgcgc acaagcttgc catgaagcac aaatgttgag	120
aaactgccta tcctgggtgac tcttcttaag agaaactgaa gagtttggtc agcagttttt	180
acaagaattc gggacctccg cttgcttctt tttttccaat atttgagcac ttagagtggg	240
ttttgttttt tcttttcaga tgtaaatgtg aaagaaaggg tgttgcatth ttacatttcc	300
ctaagtatct tgctaataaa tgctacaata gcacgcgctt cattttgggt ttttgcctcc	360
tcccactgtg tgtatgtgtg tatatgtatg ttttgaatat gttttcttta ttaaaaaata	420
ttttttgtag tttgaatatg aaatttggac caaatgataa actgcgctga gtctaaactg	480
gcaacatgta	490

<210> 318

<211> 340

<212> DNA

<213> Homo sapien

<400> 318

cctggagtc aataaccacc cctcatacc acaccctgtg catacaccag ccaagccttt	60
cctggctctg gaagggaaga gaaaaaagac gcaggccacc tgggggttct gcagctcttg	120
gtcagtcag ctttctatct tagctgcctt tggcttccgc agtgtaaacc ttgcctgccc	180
ggaggcagga ggcccagctg gacctccgag ggccatgagc aggcagcagc catcttggcc	240
tcaagcttgc ctttcccttg agtccctctc tcccctcgcc tctagccaga ggtgtagcct	300
gcagatctag gaagagaaga gctggggagg aggatgaagg	340

<210> 319
 <211> 373
 <212> DNA
 <213> Homo sapien

<400> 319
 aaagatgctg ttaatgaaca ttacggacaa ttcattggtg ggctagtgtg taacacttca 60
 gctgattttt cttatgagat ggaaaaaaaa atcagccaag taagggcaca tcttcagttc 120
 atttagaagt cagcatccaa ggtaaaagaa ttctctgttg gacttgacat cactcccatc 180
 ctctgatact cgcctactct ctctctcaaag aagttagtct ttccttccag tgaaatattc 240
 tccataaagt caaatgggtt ctctactctg aaaaccttgc taaaaccag ttccagcata 300
 agtctgtctg ccacaaactc aatgtattgc ttcattagag tgcaattcat gccaatgagc 360
 ttcacaggca agg 373

<210> 320
 <211> 509
 <212> DNA
 <213> Homo sapien

<400> 320
 aaaaacaaaa tttaattttc atttcaatta agaccctttt tggcattttg cttacttatt 60
 ctgccctttg gttaacagca tcagcatcac attactattt tatattgcat atatgtagca 120
 tttgtcttct taagttttca acatattcatt tatatttaaa ggcagacact gagtcagtat 180
 taatagatta actaaactgc actgtaattt agataaaatt actgtgtctc actgtgtatt 240
 acatgcaaaa tccacataaa ttgtcattta accaacagta ctgcacgagc gaacatctcg 300
 atatatgaaa actgcatcat caattcaacg ttttgggtact tgaaactgca tcataaatgc 360
 aacattgtca tatgtgaaaa cgacacccta agtccttctt tttaaaaatg acattgcgtt 420
 tagcttattg taagagggtg aacttttgta ttttgaact atctttaagc tcttcagttt 480
 ataattcata taaaatgcct tttgtattt 509

<210> 321
 <211> 617
 <212> DNA
 <213> Homo sapien

<400> 321
 ccaaggcccc ttttgcagcc cacggctatg gtgccttcct gactctcagt atcctcgacc 60
 gatactacac accgactatc tcacgtgaga gggcagtgga actccttagg aaatgtctgg 120
 aggagctcca gaaacgcttc atcctgaatc tgccaacctt cagtgttcga atcattgaca 180
 aaaatggcat ccatgacctg gataacattt ccttccccaac acagggtctc taacatcatg 240
 tcttccctcc cacttgccag ggaacttttt tttgatgggc tcttttattt ttttctactc 300
 ttttcaggcg cactcttgat aaatgggttaa ttcagaataa aggtgactat ggatataatt 360
 gagccctctg gtccagggtc cagtttacct aatattacct cagaaaggat atggagggaa 420
 gatgatcttt ttgccagggtc tgacttttct tctgtctccg cctccatta acgctcagta 480
 ccttttagca gctgacggcc ccacgttcta ctccatgctt ggcttccttt ccaactagct 540
 ctttcatata ttttacttgc tagtatctcc attctctcta aagtagtggt tctttttgcc 600
 cttaaactta aattttt 617

<210> 322
 <211> 403
 <212> DNA
 <213> Homo sapien

<400> 322

```

aaaaagaagg acttaggggtg tcgttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacgttgaa ttgatgatgc agttttcata tctcgagatg ttcgctcgtg      120
cagtactggt ggtaaataa caatttatgt ggattttgca tgtaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaataactga ctcagtgctt      240
gccttttaat ataatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctggt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttggt ttt .                      403

```

<210> 323

<211> 298

<212> DNA

<213> Homo sapien .

<400> 323

```

ccagaattag ggaatcagaa tcaaacacgt gtaaggcagc gctggctgcc attgcttggg      60
cacattgaaa ttggtggctt cattctagat gtagcttggt cagatgtagc aggaaaaatag      120
gaaaacctac catctcagtg agcaccagct gccttccaaa ggaggggcag ccgtgcttat      180
atttttatgg ttacaatggc acaaaattat tatcaacctt actaaaacat tctttttctc      240
ttttttcctg aattatcatg gagttttcta attctctctt ttggaatgta gatttttt      298

```

<210> 324

<211> 78

<212> DNA

<213> Homo sapien

<400> 324

```

ccatgggaag gtttaccagt agaatccttg ctaggttgat gtgggccata cattccttta      60
ataaaccatt gtgtacat .                                                    78

```

<210> 325

<211> 174

<212> DNA

<213> Homo sapien

<400> 325

```

ccatcatggt caggaactcc gggaagtcaa tgggtccggt cccatctgca tccacctcat      60
tgatcataac ctgcagctct gcttcagtgg ggttctgtcc cagggatctc atcactgtcc      120
ccaactcctt ggtggtgata gtgccatctc catccttgtc aaagagggag aagg          174

```

<210> 326

<211> 679

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (679)

<223> n = A,T,C or G

<400> 326

```

aaaactgaaa tacctcttaa aataatttga tccccagcgt ttgctctttt tgaagtaacc      60
aacttactct taaaaaggat ggntgccaaag atggaaagtc ttactgggtt ttcatgttaa      120
cctattcttt ggacataact atgaattttg tatacaatgc acttcatgaa aagttgtggc      180
tccccagat tgcccacaag tgtgatcttg aagtcctaaa catttgctca tgtaagcttc      240
aaaacagcgt taactgagtt attcaagtag cagtacttaa agatacaatt cttgaagcag      300

```

```

tttcaatggg ttctgatcca aataatcagt ttctgaacat tactacttca cataatagag 360
tccatcttca gtttcttctc actttctctt tcccttttgg gtttcctttt tgtggcctga 420
ggccaccagt tctttgggta ctatcaagat acttccatca tgggtacact ggagagcata 480
gtggttggga ttgactggcc taccttgggc atctcttaat ctactaaaaa tatcatgata 540
aaggctcatgc agtttctgtt tcattatgtt aatagctttg gtacattgtg cttgctctct 600
cttaanagtt tccttctttg cttgcaagtt acatacatca tcttctaaat tcaaaaattat 660
gtccattttg gcgtttacc

```

<210> 327

<211> 619

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(619)

<223> n = A,T,C or G

<400> 327

```

aaaataagtt actggtaaat ggagttgcat tctatagtca cttaataaat attaacaaaa 60
tatttataac tggaacctta atgaaatgta tcatcaaate aggtaaaagc aacttgtccg 120
cagttaccaa agcctanata cgcgtagat gcgccttttc cggcctgtgc gtctgctctg 180
gttctctca ggcagcaaag ctggggaagg aagctcaggc aggagcctcc ccgacgccac 240
aacggcacia gcagcagcta aagcaccgca ctttgctcta ctaacctttt acttaaatga 300
ggttttgcca aatccacatc tggaaccgcg tcacacccat ttgcaaggat gtttgttctt 360
tgatgaaact gcattctctac tgcacatgag ggctttcatt gtaggacaag aggagagttc 420
gtttattttt gtaactgttt tacatgttcc gattagttaa tcggtagctt atgtcatttg 480
ctatgcctgn agncttctaa tctctcctta ctaaaacatt acttcaaatt tgaattgacc 540
cttggttata atttatttag ccgggatttg tgtgtcattg tagagcaact ctaattcaag 600
aatagtgaca acttttaag

```

<210> 328

<211> 132

<212> DNA

<213> Homo sapien

<400> 328

```

aaatccaaat acaaaagcat agtctctgca agattttgtt ctttgaattt cttgatattg 60
taattgatta ttgataactg tcatcatgaa attatctctc aataataaga taaataaact 120
agcatatgaa tc

```

<210> 329

<211> 854

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(854)

<223> n = A,T,C or G

<400> 329

```

ccttgaggta actattgcaa aatatacagt gtaagttcag tctgatggaa accccagatt 60
catcaaggat acaaactctac agtagcccaa tggcggtttc atagtgtata atttattatc 120
aataaaaatta actccgttac aatcagcatt catttcctcc aattaaaatt aagcataaac 180

```

cctaggtagt	aaccttctgc	acatatgtat	agctccgaat	ttcctcactg	ttcgtctggt	240
gcaaaaacaa	tattcaagct	tgtctgatta	tgcataat	ctttaatcat	atagattata	300
tatacaatag	acaagacagg	actatataga	taatggacag	acttaaatgc	ccgcattttt	360
aaggtggaga	aaatgatgaa	tctatgcatc	cccgagaaca	cttaaaattt	ttttttattt	420
cactgggaaa	ttcttacagc	tactttacaa	tcataggtta	acagcctagt	tatacagaag	480
acatatccca	ctacagagct	atactctatg	caactgtttt	ttccctcat	aaacaacctg	540
agttcaaatt	gaattctatc	ttccacaatc	acaatgggtg	catcaccag	tacacagaag	600
tttgaatcac	aaaacataat	taccacaata	aaacacagt	ttcaagtatc	ttggcagagc	660
aatctgccgc	acaaactgca	aattaaatta	actacacaga	ctaaaaacta	tacagcctac	720
catcacagtt	gtgcattata	aaaaagggag	tttctttcct	ttggttttta	gtcaggaaca	780
gggtaggatt	ttttaccctc	nggccgggga	ccacgctaaa	ggggcgaaat	ttcttgccan	840
natattccnt	tcac					854

<210> 330

<211> 299

<212> DNA

<213> Homo sapien

<400> 330

ccaatgaata	actgacttta	taatcctggg	caatcagctt	ttggcggggt	gtaagtgttt	60
ctcgacactt	ttcactcatg	gattcttcaa	atztatgggt	aaagaggcac	ttatacactc	120
tgccctcacc	agcttgtgta	ttttcacaaa	aacgctcccg	atcatctcgg	caagcaaaat	180
ataaatgccg	gtctaagtga	aagtcatccg	atgacagctc	agccaccggg	agaatggctt	240
tcttgagag	ttcagaaaat	tgaatcttgg	gttctctttc	ttctgcttct	ttcaccagg	299

<210> 331

<211> 573

<212> DNA

<213> Homo sapien

<400> 331

aaagatatga	acagcttaat	tttccgtgtg	attatcta	taaaaaagaa	aaacaaaaca	60
agcaaaatgt	tcaagttaaa	aaaaaaacat	accgggtgag	caatgcacta	aaattatcca	120
catgaaaaca	aatgggtctg	aatcttataa	accaacatag	catttcactg	tcaacaatgt	180
gaaaatttaa	tatcttctca	aacaggcata	agatgaagaa	gtgctatatt	ttaattgtaa	240
aaggaactta	tgtaatgtaa	aattacatta	taatttttca	ttccgaattg	acaaatgatt	300
tcaaaaacaa	ggatcaaagt	ttgactgcaa	atagtaatgc	aatataattt	cataaaaatc	360
cttcaatttc	tatttttttc	cttttctgta	gttgacatat	gaagaccact	tcaatttcta	420
aaaaagggaa	ccattccaat	ttccctccc	caagaaaatg	tctcacaatt	acaaagtaga	480
aaaacagccg	ttcataaatg	caaaaaaatt	ctgatttata	tatgaaataa	tttctagatc	540
aattcaacat	atttgatgac	atttggttag	ttt			573

<210> 332

<211> 555

<212> DNA

<213> Homo sapien

<400> 332

aaatttgaaa	gttgtaagca	ctgatgttaa	tgtgattgat	cagcatgggc	atatgtaaaa	60
tgtccttttc	tggttgccct	tctatgctat	tgtgttcaga	tacttacacc	ataattaaac	120
agtaagtta	agacttgctg	agtttggcat	agatagtgcg	ctcattta	ctgtgcctct	180
caaaacttca	gaatattagc	atattaccac	aaataatttt	tggtgaaact	attgagatat	240
taaaattttt	gaaatcacta	ctgttacctg	ttatagaaaa	tagtggtggc	ttagtctagt	300
ctctgtgtaa	ctggttacat	tttgatgggt	gtctatactc	aactggatat	gtgtatgtaa	360
attagaaaat	acatacctat	ccagacataa	atgctaagta	acattttttt	cttcctccaa	420

ctacataatt	tgtagctcat	catttttctt	taatcctttc	ctaacttgtc	gcagcagttt	480
gaatttccca	gatatttatg	tttgaacata	atgggtcaga	atacatattt	gaacatcata	540
gttgatata	ttttt					555

<210> 333

<211> 460

<212> DNA

<213> Homo sapien

<400> 333

aaattttctt	caacagtcta	ttgggggtcca	aaaagcatat	atcaaaacaa	aaataacaaa	60
agcaaaacaa	aatgctacat	gtaaaagcta	aagaaagaaa	atgcagcata	ttcaggttct	120
ttttcttgag	gtacctatat	aaattttaatc	acctgcccc	aagtcctctc	gttaggttaa	180
aaacacaatg	cgctctgggg	agccaattgc	ccggcacgtc	ttattactga	gaaagtgcaa	240
gaatgctgat	catcttatgc	agcatactaa	aggatgattt	actctttaca	aaatagagct	300
taagtatcaa	cctgatggaa	gttagaaaaat	taaaaacatt	taagtagaat	catctctctc	360
tctatttttg	agatcctgca	gcaaaaagcc	tcccaaatca	actttcaaag	ttctgccatt	420
aaggaatggt	ggttctcttg	taaaattcag	agatctcttt			460

<210> 334

<211> 190

<212> DNA

<213> Homo sapien

<400> 334

ccaagggaag	ctgtgctcta	gcccattctga	ccctgtctgc	aaaccacctg	ggggaacaag	60
ctgatagaga	cctgtgcaga	tgtctctctc	tgtgccccct	actcatctca	ctggatctgt	120
ctgccaaacc	tgagatcagc	tgtgccagct	tggaagagct	cctgtccacc	ctccaaaagc	180
ggccccaagg						190

<210> 335

<211> 394

<212> DNA

<213> Homo sapien

<400> 335

aaatttggac	agacttctag	cggacagtta	cttctcaaga	attttctata	caaaagctgt	60
gccaggcata	tattttctca	ccaggacaca	tggggcagcg	gacccctggg	gtcagtaaga	120
acacaccag	aatgatataa	ccagatattt	ttcagtttct	aaattaaggc	atattcaaaa	180
aattccatgt	acaagtttac	accacttttc	taagttactc	accaggtaat	taaagcagat	240
tcacagatga	attactctca	gtttaactat	atgcaacaac	catgccataa	acttttcttc	300
taaattttgc	ataataatgg	ttaaaaaaag	tggtagttaa	actatcatgt	tcacaattgt	360
catttttcaa	ggcagtagaa	gaccaagaca	tttt			394

<210> 336

<211> 429

<212> DNA

<213> Homo sapien

<400> 336

aaaagctatc	accattgtag	tagaatcatc	cttctttttt	gaaatttgaa	gcatcccagg	60
cttaaaatct	tgtgtttcag	aaagacagtt	tataccatga	ctgcttaatt	atcccccaa	120
agaccttctg	attgaagtca	tgtacagttc	agtggcctaa	attctctgcc	tttttaactt	180
gctttgcaag	cctactctga	aaataagtta	tttagtcaag	ttattctcaa	agatgtccca	240
gttgcttaga	aaggatcaaa	tggaacattt	gacacacata	ctcaaaaaaa	tgtaactgac	300

tataaact	ttaccta	catctgtatc	aaactttcta	aaaatcaa	ctcaggattg	360
ttccacttta	gagattctat	gtaaagtta	tataactata	cttgtcaa	agcacctatc	420
tatgcattt						429

<210> 337

<211> 373

<212> DNA

<213> Homo sapien

<400> 337

aaagatgctg	ttaatgaaca	ttacggacaa	ttcatgggtg	ggctagttag	taacacttca	60
gctgattttt	cttatgagat	ggaaaaaaaa	atcagccaag	taagggcaca	tcttcagttc	120
attagaagt	cagcatccaa	ggtaaaagaa	ttctctgttg	gacttgacat	cactcccatc	180
ctctgatact	cgctactctt	cttctcaaa	aagttagtct	ttccttccag	tgaaatattc	240
tccataaagt	caaatgggtt	ctctactctg	aaaaccttgc	taaaaaccag	ttccagcata	300
agtctgtctg	ccacaaactc	aatgtattgc	ttcatcagag	tgcaattcat	cccaatgagt	360
ttcacaggca	agg					373

<210> 338

<211> 366

<212> DNA

<213> Homo sapien

<400> 338

ccatccccct	atgagcgggc	gcagtgatta	taggctttcg	ctctaagatt	aaaaatgccc	60
tagcccactt	cttaccacaa	ggcacaccta	cacccttat	ccccatacta	gttattatcg	120
aaaccatcag	cctactcatt	caaccaatag	ccctggccgt	acgcctaacc	gtaacatta	180
ctgcaggcca	cctactcatg	cacctaattg	gaagcgccac	cctagcaata	tcaaccatta	240
accttccctc	tacaattatc	atcttcacaa	ttctaattct	actgactatc	ctagaaatcg	300
ctgtcgccct	aatccaagcc	tacgttttca	cacttctagt	aagcctctac	ctgracgaca	360
acacat						366

<210> 339

<211> 319

<212> DNA

<213> Homo sapien

<400> 339

ccttccctcc	ccaccacat	caacctcttc	aaaacctact	ccctccctct	aagtatctct	60
caacacagta	tgtctggggc	tagatttcaa	aaccacgta	atgaaaaagt	cagttttaca	120
agcctaattt	tgttgTTTTT	TTTTTTatat	caattaacgt	taaaaattgc	atcaactatt	180
taattcatga	ggatctttca	tattaaaatt	taaccttaag	attcaaccgc	catgtgcttt	240
tataaaggaa	acatttttta	gagacgtctg	agctcacttt	tacatggtgg	tgctactgct	300
cgtaaatgtt	tgtgatttt					319

<210> 340

<211> 278

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (278)

<223> n = A,T,C or G

<400> 340

ctaataaaat	gaattaacca	ctcattcatn	natctaccca	cccnatccaa	catctccnca	60
tgatgaaacn	ncggctcact	ccttggcgcc	tgcctgatec	tccaantcac	cacaggacta	120
ttcctagcca	tgactactn	accagacncc	tcaacngcct	tttnatcaat	nggncacatn	180
actcganacn	taaatnatgg	ctgaatcatc	cgctacctnc	acgccaatgg	cagcctcaat	240
attctttatg	ctgcctcttc	ctacacatgc	gggcgagg			278

<210> 341

<211> 400

<212> DNA

<213> Homo sapien

<400> 341

ccagcatggg	gctgcagctg	aacctcacct	atgagaggaa	ggacaacacg	acggtgacaa	60
ggetttctcaa	catcaacccc	aacaagacct	cggccagcgg	gagctgcggc	gcccacctgg	120
tgactctgga	gctgcacagc	gagggcacca	cgcctctgct	cttccagttc	gggatgaatg	180
caagtcttag	cgggtttttc	ctacaaggaa	ttcagttgaa	tacaattctt	cctgacgcca	240
gagaccctgc	ctttaaagct	gccaacggct	ccttgcgagc	gctgcaggcc	acagtcggca	300
attcttcaaa	gtgcaacgcg	gaggagcacg	tccgtgtcac	gaaggcggtt	tcagtcaata	360
tattcaaaagt	gtgggtccag	gctttcaagg	tggaagggtg			400

<210> 342

<211> 536

<212> DNA

<213> Homo sapien

<400> 342

aaagaacaat	gggaaaaaca	agtcctgtgt	ctcacagatg	ctgtcgatga	cattacttcc	60
attgatgact	tcttggtgtg	ctcagagaat	cacattttgg	aagatgtgaa	caaatgtgtc	120
attgctcttc	aagagaagga	tytggtggc	ctggaccgca	cagctgggtg	aattcgaggc	180
cgggcagccc	gggtcattca	cgtagtcacc	tcagagatgg	acaactatga	gccaggagtc	240
tacacagaga	aggttctgga	agccactaag	ctgctctcca	acacagtcac	gccacgtttt	300
actgagcaag	tagaagcagc	cgtggaagcc	ctcagctcgg	accctgcccc	gcccattggat	360
gagaatgagt	ttatcgatgc	ttcccgctg	gtatatgatg	gcatccggga	catcaggaaa	420
gcagtgtgta	tgataaggac	ccctgaggag	ttggatgact	ctgactttga	gacagaagat	480
tttgatgtca	gaagcaggac	gagcgtccag	acagaagacg	atcagctgat	agctgg	536

<210> 343

<211> 646

<212> DNA

<213> Homo sapien

<400> 343

aaaacttcta	ttcatcaaaa	gacataaaga	aaacagtcaa	gccacagact	aggtgtaata	60
tctcaataca	tatatccgac	aagagaattg	catctagaat	gtataaagaa	tttctatgac	120
ccaattatag	ctatcaggga	tatacaaat	aaaacaaaaa	tgaaacatca	ctacacaccg	180
attggaatgg	ttaaaaagga	aaaatactga	caacaccaat	atgtgtaaag	acaggaggta	240
ccagaactct	cattcattat	attcataaat	tgacaaatat	aaaaactgct	atagtagggc	300
agtcttcctt	agaaagggat	tgtggggcatg	acagagaaca	atattaatct	gtccattata	360
ttccttaact	gtaaaatgga	gaccatatgt	tccaccagct	tcacttggtg	attatgatac	420
atggctatta	agagactcaa	atgactccat	ttcatcaact	aatatgccct	gtcaattcta	480
cttctaaagt	atcccatgtt	ctatccaatg	tcataccact	atcataattt	aagtgttcat	540
aactctctat	aatatttcaa	taatctaact	ggtctcaatg	cctgtagtag	aaattgcaga	600
ttgggctccc	caatttctgt	tccctaggaa	ggctgagaaa	gctttt		646

<210> 344
 <211> 383
 <212> DNA
 <213> Homo sapien

<400> 344
 cctgcacccc agtataaggg cctccccagc tgagtaagaa gctgcttccc ctctctcat 60
 aggccaagcc tattgtgtga aaccatctca tggctcttgg gacgtagacc atttttgaaa 120
 ccgtctcatg gtcttggtga cgtagaccgt ttgcttcttt aactccagcc gcggaatgac 180
 attagtggaa ccgggctagg gaactgctgg aagttcagga tggcaccacc ttgaacacct 240
 aggccaggga tccccacat gtcccgggtt tctttcttcg agagtataga accgttcatt 300
 cttgctttgt gtcccatcc atctcttgaa aaaatgtagt ctttgaatgt gtgaaaatct 360
 agggacattc aatctagtct ttt 383

<210> 345
 <211> 263
 <212> DNA
 <213> Homo sapien

<400> 345
 cctccccctc ccctttgctg gtgggaggag ctctgtgtct ccttggccgc ttactggaag 60
 ggcgtttttc agagctgcag ggacagggtg agcagctgaa gggctaggag ggaagccggc 120
 ccccgctctg cagaagctgc atttcagctg aatctgtgtt tcagcctcag ttggttgac 180
 cgttagcccc tctcctccc gatggtcatg tttttgtcac attagagaat aaacagccac 240
 acacacattt ttttttttcc ttt 263

<210> 346
 <211> 132
 <212> DNA
 <213> Homo sapien

<400> 346
 aaatccaaat acaaaaagcat agtctctgca agattttgtt ctttgaattt cttgatattg 60
 taattgatta ttgataactg tcatcatgaa attatctctc aataataaga taaataaact 120
 agcatatgaa tc 132

<210> 347
 <211> 564
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(564)
 <223> n = A,T,C or G

<400> 347
 cctgggtatc caggagggt ctgcagccct gctgaagggc cctaactaga gtcttagagt 60
 ttctgattct gtttctcagt agtcctttta gaggcttggc atacttggc tgcttcaagg 120
 aggtcgacct tctaagtgtat gaagaatggg atgcatttga tctcaagacc aaagacagat 180
 gtcagtgggc tgctctggcc ctggtgtgca cggctgtggc agctgttgat gccagtgtcc 240
 tctaactcat gctgtccttg tgattaaaca cctctatctc ccttgggaat aagcacatac 300
 aggcttaagc tctaagatag ataggtgttt gtccttttac catcgagcta cttcccataa 360
 taaccacttt gcatccaaca ctcttcaccc acctcccata cgcaagggga tgtggatact 420
 tggcccaaag taactggtgg taggaatctt agaaacaaga ccacttatac tgtctgtctg 480

aggnagaaga taacagcagc atctcgacca gcctctgcct taaaggaaat ctttattaat 540
cacgtatggt tcacaagata attc 564

<210> 348
<211> 321
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(321)
<223> n = A,T,C or G

<400> 348
gcncatgaac anggagcaac ganaagagat gtcgggctaa gggcccgga cgggcggcac 60
ccatcctgcn acggaacacn ttcgggtnt ggttttgatt ngttcacctc tgtttatatg 120
cancatattg ntccctctcc cccaccccag nccccaaactt catgcttntc ttccgcnctc 180
agcnccttg ccttgcttc gcggtgagtc antgaccacn gnttccctg cangagccgc 240
cgggcgtgag acncngaccc tcnntgcata caccaggccg ggcccnngct ggctccccc 300
gnggcctgt gaaanagctg g 321

<210> 349
<211> 255
<212> DNA
<213> Homo sapien

<400> 349
ccatgacagt gaaggggctg ttaggaatat caacaccacc gaagcgcaca tagatcacat 60
atgtgcccgg cttggcagct gtgtagaaga tgtcataggt tccatcttca ttctcaatga 120
catcgccctc ggctcagtg ccattctggg tcagaaccgt gcaggtcact ttacccttcc 180
cggcagtcctt ggcatacaacc acaaagccta ctctctcgcc agttttcaca gtggaggcga 240
ttccaggacc cgtag 255

<210> 350
<211> 496
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(496)
<223> n = A,T,C or G

<400> 350
gggcttattn gtcacaaaa tcattcnctt ttggaactat ggccaattga agctacacac 60
tgaatttatt aatacagcat taagtttctt tgtgtnaaaa aatctttgtn cncagtaata 120
aaaaaagata aggcaagatg cattaaacat gaaaccttct ggctcttttc ctctgcgttt 180
ttacagagcc actgatgact atctgcaaca aaagagttaa gtttctgatt ttccgtatca 240
agcatcttat gcctttgctg tggtagaaga tctggccaag caccctgaag gacagatgct 300
ggtgatggnc tttggcactt atgctggcaa actgagcttc ttcccttga gtacttttgn 360
aatgtacaag tagaagaagt cacaagtata ggatggctcg gactacgccg gccaccacag 420
caatgaggtc aaagaagccc tcaaagnaga agcgnccaga tccagttgac aagatacaaa 480
gcacgataga ggccca 496

<210> 351

<211> 109
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(109)
<223> n = A,T,C or G

<400> 351
ccatagtga gcttgggaat gagtggtact gcagcatctg ggctgccanc cacaggggaag .60
ggccaagccc catgtagccc cagtcacccct gccagacccc gctcctctgg 109

<210> 352
<211> 384
<212> DNA
<213> Homo sapien

<400> 352
ccttcgagag tgacctggct gccaccagg accgtgtgga gcagattgcc gccatcgcac 60
aggagctcaa tgagctggac tattatgact caccagtggt caacgcccgt tgccaaaaga 120
tctgtgacca gtgggacaat ctggggggccc taactcagaa gcgaaggga gctctggagc 180
ggaccgagaa actgctggag accattgacc agctgtactt ggagtatgcc aagcgggctg 240
cacccttcaa caactggatg gagggggcca tggaggacct gcaggacacc ttcattgtgc 300
acaccattga ggagatccag ggactgacca cagcccatga gcagttcaag gccaccctcc 360
ctgatgccga caaggagcgc ctgg 384

<210> 353
<211> 345
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(345)
<223> n = A,T,C or G

<400> 353
ccttggtcag gatgaagtng gctgacacac cttagcttgg ntttgcttat tcaaaagana 60
aaataactac acatggaaat gaaactagct gaagcctttt cttgttttan caactgaaaa 120
ttgnacttgg ncacttttgt gcttgaggag gccattttc tgcctggcag ggggcaggta 180
tgtgccctcc cgctgactcc tgctgtgtcc tgaggtgcat ttcctgttgn ncacacaang 240
gccangntcc attctccctc ccttttcacc agngccacan cctnntctgg aaaaangacc 300
agnggtcccc gaggaaccca tttgngctct gcttggacag canag 345

<210> 354
<211> 712
<212> DNA
<213> Homo sapien

<400> 354
ccatctacaa tagcatcaat ggtgccatca ccagttctc ttgcaacatc tcccacctca 60
gcagcctgat cgctcagcta gaagagaagc agcagcagcc caccagggag ctctgcagg 120
acattgggga cacattgagc agggctgaaa gaatcaggat tcctgaacct tggatcacac 180
ctccagattt gcaagagaaa atccacattt ttgccccaaa atgtctattt ttgacggaga 240

gtctaaagca	gttcacagaa	aaaatgcagt	cagatatgga	gaaaatccaa	gaattaagag	300
aggctcagtt	atactcagtg	gacgtgactc	tggacccaga	cacggcctac	cccagcctga	360
tctctctga	taatctgcgg	caagtgcggg	acagttacct	ccaacaggac	ctgcctgaca	420
accccgagag	gttcaatctg	tttccctgtg	tcttgggctc	tccatgcttc	atcgccggga	480
gacattattg	ggaggtagag	gtgggagata	aagccaagtg	gaccataggt	gtctgtgaag	540
actcagtggtg	cagaaaagg	ggagtaacct	cagcccccca	gaatggattc	tgggcagtgt	600
ctttgtggta	tgggaaagaa	tattgggctc	ttacctccca	atgactgcc	taccctgcg	660
gaccccgctc	cagcgggtgg	gggattttct	tggactatga	tgctggggga	gg	712

<210> 355

<211> 385

<212> DNA

<213> Homo sapien

<400> 355

cctcatagcc	gcttagcaca	gttacagaat	gtctgaaggg	gacagtgtgg	gagaatccgt	60
ccatgggaaa	ccttcggtgg	tgtacagatt	tttcacaaga	cttggacaga	tttatcagtc	120
ctggctagac	aagtccacac	cctacacggc	tgtgcgattg	gtcgtgacac	tgggcctgag	180
ctttgtctac	atgattcgag	tttacctgct	gcagggttgg	tacattgtga	cctatgcctt	240
ggggatctac	catctaaatc	ttttcatagc	ttttctttct	cccaaagtgg	atccttcctt	300
aatggaagac	tcagatgacg	gtccttcgct	acccaccaa	cayaacgagg	aattccgccc	360
cttcattcga	aggctcccag	agttt				385

<210> 356

<211> 347

<212> DNA

<213> Homo sapien

<400> 356

aaatgagata	aagaaagtct	ccttttgttt	ttagatggaa	aagaaagcac	aagttttttc	60
tacctgtgaa	tgaactttgg	tgacctatat	gtgccattca	tgacgatttc	ttgttcatat	120
tggcttagaa	ttcagtgcat	gaatatcatt	acattcttat	atctaacatt	cctagtttagc	180
tttgattcaa	aatatacaaa	atctgataca	tgaatacttt	gctagattaa	tgacttgatc	240
atctttggaa	tgagtaggca	agacgatttt	tacctattat	ttctatgttg	tgggtaattg	300
taaaactaaa	tacagatgat	aataattgct	atttcacagt	gatgttt		347

<210> 357

<211> 313

<212> DNA

<213> Homo sapien

<400> 357

aaagtaatca	acctctctgt	ccttccatta	gtctggatcg	tctaaagatt	gttttatttt	60
tagaggctca	tccggtcaga	tgtagtgat	gtgaaatttc	aggccaggcg	tgacgtcagc	120
gtggcatttg	aaacagctcc	atgttgccct	tagtgctgtc	tgaccgaagc	ctgtctgtcc	180
tcagatataa	agatgaagcg	cagctgtata	aagaagagca	cctgaggaat	cggcagcacc	240
ctcactgcta	cgttcagtac	atgatcgcca	tcatacaaa	ctgccagacc	ttcaaggaat	300
ccatagtcag	ttt					313

<210> 358

<211> 403

<212> DNA

<213> Homo sapien

<400> 358

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aaaaagaagg acttaggggtg tctgttttcac atatgacaat gttgcattta tgatgcagtt      60
tcaagtacca aaacgttgaa ttgatgatgc agttttcata tatcgagatg ttcgctcgtg      120
cagtactggt gggttaaatga caatttatgt ggattttgca tgaatacac agtgagacac      180
agtaatttta tctaaattac agtgcagttt agttaatcta ttaatactga ctgagtgctt      240
gccttttaat ataatgata tgttgaaaac ttaaggaagc aaatgctaca tatatgcaat      300
ataaaatagt aatgtgatgc tgatgctgtt aaccaaaggg cagaataaat aagcaaaatg      360
ccaaaagggg tcttaattga aatgaaaatt taattttgtt ttt                               403

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<210> 359
<211> 411
<212> DNA
<213> Homo sapien

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<400> 359
aaataaatac ttagaacacg acttgggtcc tacaagcatc tggacitctag gtctcagtac      60
tggagtgtct caccatggg cccacgcag ggacgccacg gtccctccc acccgtgat      120
caagacacgg aatcggtgc cgatggttg atcgcaatgc gcccttttc tagagccttc      180
cccgcccatc tacaggcagg atgcccgtgg gaaaaagaca actggaattt ctggaagggt      240
gatggtccgc acggttgagg attctacgtg gttctcttgg tcccttgggt gtgtgtgtgt      300
gtggaggagg ccgcccctc tagatcacct tcttgagctc gtcgtacagg accagcacga      360
aggcgcccc catgccccgc aggacgttgg accacgcacc cttgaagaag g                               411

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<210> 360
<211> 378
<212> DNA
<213> Homo sapien

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<220>
<221> misc_feature
<222> (1)...(378)
<223> n = A,T,C or G

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<400> 360
cctcttcagg ggcccagacc agggacaggg ccttggtttc cttctccctg gcttctgcct      60
cagctctgtc cctctcatcc gcgtatttgg aagagatgtt tttctcctcg gctaacaact      120
gatcaaatct cctctgttcc tttccagggt tggacacgag ttgccgtgg ttgtccaat
180caacaaccag gtcgtccagc tctgctgaa gcctgttctt ggtcttttcc agtttatcat
240
aagcggccgc cttctcctcg tactgctggg tgaggntctc gatctccttc tggaacctct      300
tcttcccttc ttccagagct tccacgngc tggcaaagtc ctgcagcttc ttcttcgagt      360
cggagagctg gatgttga                               378

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<210> 361
<211> 372
<212> DNA
<213> Homo sapien

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<400> 361
aaatactggg ggccattaag agtggatgta gctaagagct tagctaacat tgccttttca      60
ctctattttt ctcagatatt gtaagcattc tgttttcaa tattgtagtt aattttttgg      120
ctttcaacag cagccctagt aatggtggag ttgttaatta atgtgtatat tgtactgaat      180
ttctgtcagt taaggggttc actgctttgg tggaaattgg tggaaattgc tagcaggttc      240
cacgatgttt atttttttct ccatgttgta tatcattacc atttcacata cgcgtttcta      300
tttttcttcc tctcctcctg atctccttaa aaatgaatct agagtgggtg gctttttccc      360
cctcctcttt gg                               372

```

<210> 362

<211> 544

<212> DNA

<213> Homo sapien

<400> 362

cctgagtcac	ctagcatagg	gttgcagcaa	gccctggatt	cagagtgtta	aacagaggct	60
tgccctcttc	aggacaacag	ttccaattcc	aaggagccta	cctgagggtcc	ctactctcac	120
tgggggtcccc	aggatgaaaa	cgacaatgtg	ccttttttatt	attattttatt	tgggtggtcct	180
gtgttatatta	agagatcaaa	tgtataacca	cctagctctt	ttcacctgac	ttagtaataa	240
ctcataactaa	ctgggtttgga	tgccctgggtt	gtgactttcta	ctgaccgcta	gataaacgtg	300
tgccctgtccc	ccagggtggtg	ggaataattt	acaatctgtc	caaccagaaa	agaatgtgtg	360
tggtttgagca	gcattgacac	atatctactt	tgataagaga	cttcctgatt	ctctaggtcg	420
gttcgtggtt	atcccattgt	ggaaattcat	cttgaatccc	attgtccctat	agtcctagca	480
ataagagaaa	tttcctcaag	tttccatgtg	cggttctcct	agctgcagca	atactttgac	540
attt						544

<210> 363

<211> 328

<212> DNA

<213> Homo sapien

<400> 363

aaactgggta	tgacaaaagc	cttttagttgt	gtttcttgaa	ctataaagaa	aacaaatttt	60
ggcagtcctt	aagtatatat	agcttaaaat	ataattttta	gcatttgga	ccatatgtat	120
gccattatat	ttgattttgc	attactgttt	cacaatgaag	ctttctttaa	ggctttgatt	180
tttatgatta	tgaagaaat	aaggcacaa	cacagttttt	ctttcttaaa	tttcatcact	240
gttgatgtgg	ttctttttgt	ttaaaaaaaa	aaagtgcac	tatcaaaact	aaaaaattat	300
agagtaatat	tgccgttctg	ctgatttt				328

<210> 364

<211> 569

<212> DNA

<213> Homo sapien

<400> 364

cctgggcacc	tctttgcttg	aaatatggca	agacttgga	aaatgtttgc	ccttagaatc	60
tatctcacta	ctttagttag	ttgtctcctt	tgggcctggg	cacagtctctg	gccctgatct	120
ggaacagact	cccttttcta	aaactgaact	tgaccacatc	aaaagtttgt	aaaacaatct	180
ccatggtaat	taaacttgca	ttcaacacca	tatggtaaca	gaagatggca	aaggataaga	240
ttcagatctt	agatctttcc	aagttagggca	tgtagatga	tagaaggatt	agttgcaagc	300
tggatctgag	ctcaggcttg	ggcatgaagg	aaactgtctc	ccatgtgggt	tggaagagtt	360
aggggctccc	tgagctctat	tgtgaactat	acgggtttca	tccaaggaat	ggtatgatgt	420
gggcataaaa	ccattcttca	gacaactgaa	gatgggtccc	ttctgtagcc	agaaacacta	480
gctgtcctgc	attgtccatt	tccttttagcc	ccaggcggtc	ctgtgtgtac	agggaggtct	540
cctgtaaggg	aatggtttcc	ttggcttg				569

<210> 365

<211> 151

<212> DNA

<213> Homo sapien

<400> 365

aaaaaaaaa	atccttttat	tatggaattt	gtcaaacaca	cacacaagca	taacaaaccc	60
-----------	------------	------------	------------	------------	------------	----

ctaggtaccc atctccaagt tttagacccct attataatct catcttcagt gttttattat 120
ccacttcttc tctctctatc tttagtattt t 151

<210> 366

<211> 508

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(508)

<223> n = A,T,C or G

<400> 366

agtataaaga tatattccat aaaagagttt ggcagtcacaa ganaagcatc gcacttccga 60
aaaacacaag cattcttctc ctagtctaca gagaattgng taaaaaaaaa aaaaaatcat 120
catcaacagc cncantnta cncacacta gaatgtacac tccggcaagt aaattaaggn 180
tgcagtccat ccctgaacga tganaagngg tctgagctat gycaaaagngt tanaaagtag 240
cccagctana caaatgcccc agctatcccc aggggagtta ttcagtactt aanacttcat 300
ttccaananc agccccggaa aagccctgac aggaaggggg gaccagngat caccgatntc 360
ccattagggg cggncaccaa aaacaaaatg cctggagctt ntgagcagct gcagcctggg 420
gttggtggcta ggcncngggg gnggttgcaa aaaaacggct gtntccgggg agaggcaaat 480
ggcaggccag ccagccctgg gtacatgg 508

<210> 367

<211> 382

<212> DNA

<213> Homo sapien

<400> 367

cctgagcggc tagtctttaa gatgcgcttc tategtttgc tgcaaatccg agcagaagcc 60
ctcctggcgg caggcagcca tgtgatcatt ctgggtgacc tgaatacagc ccaccgcccc 120
attgaccact gggatgcagt caacctggaa tgctttgaag aggaccagc ggcgaagtgg 180
atggacagct tgctcagtaa cttgggggtgc cagtctgcct ctcatgtagg gcccttcac 240
gatagctacc gctgcttcca accaaagcag gagggggacct tcacctgctg gtcagcagtc 300
actggcgccc gccatctcaa ctatggctcc cggcttgact atgtgctggg ggacaggacc 360
ctggctcatag acacctttca gg 382

<210> 368

<211> 174

<212> DNA

<213> Homo sapien

<400> 368

ccttctccct ctttgacaag gatggagatg gcactatcac caccaaggag ttggggacag 60
tgatgagatc cctgggacag aacccactg aagcagagct gcaggatatg atcaatgagg 120
tgatgacaga tgggaacggg accattgact tccggaggtt cctgaccatg atgg 174

<210> 369

<211> 216

<212> DNA

<213> Homo sapien

<400> 369

aaatctcatg ggttctatta aaaaaatata tatatagggc cccaatccat tgccatcaaa 60

```

ttgcccttgg acttttccaa ggtatattat ggggttttat gcaaaattcc aagctaccat 120
gtaacttttt ttaaccattt aacaaggagg gggaactgtt tcctaccttc tttacatgtt 180
gtgcattgtt gtggtccaga aatgccaaac cttttt 216

```

```

<210> 370
<211> 344
<212> DNA
<213> Homo sapien

```

```

<400> 370
ccttggtcag gatgaagttg gctgacacag cttagcttgg ttttgcttat tcaaaagaga 60
aaataactac acatggaaat gaaactagct gaagcctttt cttgttttag caactgaaaa 120
ttgtacttgg tcacttttgt gcttgaggag gccattttt tgctggcag ggggcaggtc 180
tgtgccctcc cgctgactcc tgctgtgtcc tgaggtgcat ttctgttgt acacacaagg 240
gccaggctcc atttccctcc cctttccacc agtggcacag cctctgtctgg aaaaaggacc 300
aggggtcccg gaggaaccca tttgtgctct gcttggacag cagg 344

```

```

<210> 371
<211> 741
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(741)
<223> n = A,T,C or G

```

```

<400> 371
aaattacata tctaattgtg tgatttggtt aatgccatt tcttcattta agtgctaagt 60
gctaagtgtg gcagtttgtt ccctgctaca ctccaaggca caaaggagtt caagggaatgt 120
gcaatggaaa tcagtttagat gaatgtgtta ggaaccttcc ctttaataaa gctggatccc 180
acactagccc ctacaccctc tcatcaccaa atattcctgc ttctctcac ctgcacttgc 240
tgttctctcc tctgccacac aaatctacct ctcaagccta ggtcccacct gcttcatgac 300
aactttccag actattccag aacctttaac catctctgac ctctcatcag atctatgttg 360
tacataacac caattaatga gatcattact gctttatgct ctaattgctt cctgtattca 420
aaatcttctc tccaaccaca taatgactcc ctaaaacttct cttgtatttt ccaatgcctt 480
gtacaagcac agaactggtc aatcaataaa tactcactgg ttatttgagg aaaaaatgtt 540
gccaagcacc atctttatca gaaaataaat caattcttct aaacttggag aaatcacctt 600
attcctagta tgtgatctta attagaacaa ttcagattga gaangngaca gcatgctggc 660
agtctcaga gccctcgctt gctctcggnn cctccctgcc tgggctccca ctttgggtggc 720
atttgaggag cccttcagcc t 741

```

```

<210> 372
<211> 218
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(218)
<223> n = A,T,C or G

```

```

<400> 372
ccgccagtgt gctggaattc gcccttggcc gcccgggcag gtaccacaac agcaggncctg 60

```

```

agtgagaaat ctaccacctt ctacagtagc cccagatcac cggacacaac actctcacct 120
gccagcacga caagctcagg cgtcagtga gaatccacca cctccacag cgcaccaggc 180
tcaacgcaca caacagcatt ccctggcagt accttggn 218

```

```

<210> 373
<211> 168
<212> DNA
<213> Homo sapien

```

```

<400> 373
actgctaggg aatgctgttg tgtgcattga gcctggtcgg ctgtgggagg tgggtggattc 60
ttcactgacg cctgagcttg tcgtgctggc aggtgagagt gttgtgtccg gtgatctggg 120
gctactgtag aaggtggtag atttctcact caggcctgct gttgtggt 168

```

```

<210> 374
<211> 154
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(154)
<223> n = A,T,C or G

```

```

<400> 374
tgagaaatct accaccttct acagngagcc ccanatcacc ggacacaaca ctctcacctg 60
ccagcacgac aagctcaggc gtcagtgaag aatccaccac ctccacagc cgaccaggct 120
caacgcacac aacagcattc cctggcagta cctc 154

```

```

<210> 375
<211> 275
<212> DNA
<213> Homo sapien

```

```

<400> 375
actgccaggg gacagtgttg tgtcagttga acctgggctg ctgtgggaag ttgttgattc 60
ctgactgggg cctgaggttg tgggtctggc aggtaacagt gttgtatccg ttgagcctgg 120
gtgtgtgttg gaagttgtag aatgccgact gaggcctggc gtgggtggtgc tgtcaggga 180
tgctgttgtg tgcgttgagc ctggtcggct gtgggaggtg gtggattctt cactgacgcc 240
tgagcttgct gtgctggcag gtgagagtgt tgtgg 275

```

```

<210> 376
<211> 191
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1)...(191)
<223> n = A,T,C or G

```

```

<400> 376
actgccaggg gacagtgttg tgtcagttga acctgagctg ctgtgggaag ttgttgattc 60
ctgactggag cctgaggttg tgggtctggc aggtaacagt gttgtatccg ttgagcctgg 120
gctgctgttg gaagttgtag aatgccgact gaggcctgcc gtgggtggtgc tgntaggga 180

```

tgctgctagc g 191

<210> 377
<211> 476
<212> DNA
<213> Homo sapien

<400> 377
ccgccagtgt gctggaattc gcccttggcc gcccgggcag gtacatttcc ttgtagactc 60
tgtaatttcc ctgcagctcc tggttgggtc tggagcagat gatctcaatg agagagtcct 120
cgtcgggtcc cagccccctc atggaagctt ttagctcaga agcgtcatac tgagcaggtg 180
tcttcaatag gcccaaaatc accgtctcca ggtggccaga taaggctgac ttcagtgtgtg 240
atgcaagttc ctttttgggt cttctctggt aggcgaaggc aatatcctgt ctctgtgcat 300
tgctgcggtt ggtcaaaatg ttgacaatgg tgacctcacc cacacctttg gtcttgatgg 360
ctgtttcaat gttcaaagca tcccgctcag catcaaagtt agtataggct ttgacagacc 420
catatgcact tgggggtgta gagtgatcac cctccaagcc gagcttgac accgatt 476

<210> 378
<211> 455
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(455)
<223> n = A,T,C or G

<400> 378
agtgtgctgg aattcgccct tggccgcccg ggcaggtaca catcccatct tcaaatttaa 60
aatcatattg tcagttgtcc aaagcagctt gaatttaaag tttgtgctat aaaattgtgc 120
aaatatgtta aggattgaga cccaccaatg cactactgta atatttctgt tcttaaattt 180
cttccacctt cagataatag acaacaagtc tgagaaacta aggctaacca aacttagata 240
taaatcctac caataaaatt tttcagtttt aagttttaca gtttgattta aaaacaaaac 300
agaaacaaat ttcaaaataa atcacatctt ctcttaaaac ttggcaaacc cttccctaac 360
tgtccaagtn tgagcatata ctgccactgg ctttagatac tccaattaaa tgcactactc 420
tttactgggt ctgaatgaag tatggtgaaa caagc 455

<210> 379
<211> 297
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(297)
<223> n = A,T,C or G

<400> 379
agctcggatc cctagnacgg ccgccagtgt gctggaattc gcccttagcg gcggccccggg 60
caggtacaaa gaatccttag acgccatact gagttttaag ttccttaatt cctaatttaa 120
ggcttctagt gaagcctcct cacagtaggc ttacttaggc ccacagtgcc cctagacctc 180
tgacaatccc accctagaca gactttattg caaaatgcgc ctgaagaggc agatgattcc 240
caagagaact caccaaatac agacaaatgt cctagatctc tagtgtggna gaactat 297

<210> 380

<211> 144
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(144)
 <223> n = A,T,C or G

<400> 380
 actttgctga aaattctttt tcccagggtc tataaaacat taatttggtt ttatatattta 60
 ctattttttt gngttttttt gtttttaaat caataagtaa tctaggacta gcattatggt 120
 tgctagacct ggcatttgct cggc 144

<210> 381
 <211> 424
 <212> DNA
 <213> Homo sapien

<400> 381
 actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg 60
 aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
 catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
 tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
 acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
 ttctccctat gtggtcgctc cagacttggg aaactattca tgaatattta tattgtatgg 360
 taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg 420
 aaaa 424

<210> 382
 <211> 408
 <212> DNA
 <213> Homo sapien

<400> 382
 actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg 60
 aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
 catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
 tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
 acagcttaca gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
 ttctccctat gtggtcgctc cagacttggg aaactattca tgaatattta tattgtatgg 360
 taatatagtt attgcacaag ttcaataaaa atctgctctt tgtatgac 408

<210> 383
 <211> 455
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(455)
 <223> n = A,T,C or G

<400> 383
 actcttgaat acaagtttct gataccactg cactgtctga gaatttccaa aactttaatg 60

```

aactaactgn cnncttcacg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tganncttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 240
acagcttata gcaatttgat aaaatatact tttgtgaaca aaaattgaga catttacatt 300
ttctccctat gtggtcgctc cagacttggn aaactattca tgaatattta tattgtatgg 360
taatatagtt attgcacaag ttcaataaaa atctgctctt tgtataacag aatacatttg 420
aaaacattgg ttatattacc aagactttga ctaga 455

```

<210> 384

<211> 376

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (376)

<223> n = A,T,C or G

<400> 384

```

actcttgaat acaaggttct gatatcactg cactgtctga gaatttccaa aactttaatg 60
aactaactga cagcttcacg aaactgtcca ccaagatcaa gcagagaaaa taattaattt 120
catgggacta aatgaactaa tgaggataat attttcataa ttttttattt gaaattttgc 180
tgattcttta aatgtcttgt ttcccagatt tcaggaaact ttttttcttt ttaagctatc 240
cacagcttac agcaatttga taaaatatac ttttgnaac aaaaattgag acatttacat 300
tttctccta tgtgggcgct ccagacttgg gaaactattc atgaatattt atattgnatg 360
ggaatatagc attgcc 376

```

<210> 385

<211> 422

<212> DNA

<213> Homo sapien

<400> 385

```

acctgtgggt ttattaccta tgggtttata tcttcaaata cgacattcta gtcaaagtct 60
tggtaatata accaatgttt tcaaagtgtat tctgtcatat aaagagcaga tttttattga 120
acttgtgcaa taactatatt accatacaat ataaatattc atgaatagtt tccaagtctt 180
ggagcgacca cataggaga aaatgtaaaat gtctcaattt ttgttcacaa aagtatatatt 240
tatcaaattg ctgtaagctg tggatagctt aaaagaaaaa aagtttcctg aaatctggga 300
aacaagacat ttaaagaatc agcaaaattt caaataaaaa attatgaaaa tattatcctc 360
attagttcat ttagtcccat gaaattaatt attttctctg cttgatcttg gtggacagtt 420
tc 422

```

<210> 386

<211> 313

<212> DNA

<213> Homo sapien

<400> 386

```

caagtaggtc tacaagacgc tacttcccct atcatagaag agcttatcac ctttcatgat 60
cacgcctca taatcatttt ctttatctgc ttcctagtc tgtatgccct ttccctaaca 120
ctcacaacaa aactaactaa tactaacatc tcagacgctc aggaaataga aaccgtctga 180
actatcctgc ccgccatcat cctagtcttc atcgccctcc catccctacg catcctttac 240
ataacagacg aggtcaacga tccctcccct accatcaaat caattggcca ccaatggtac 300
tgaacctacg agt 313

```

<210> 387
<211> 236
<212> DNA
<213> Homo sapien

<400> 387
cgccctcata atcattttcc ttatctgctt cctagtcctg tatgcccttt tcttaacact 60
cacaacaaaa ctaactaata ctaacatctc agacgctcag gaaatagaaa ccgtctgaac 120
tatcctgccc gccatcatcc tagtcctcat cgccctccca tccctacgca tccctttacat 180
aacagacgag gtcaacgata cctcccttac catcaaatca attggccacc aatggt 236

<210> 388
<211> 195
<212> DNA
<213> Homo sapien

<400> 388
acgccctttt cctaacactc acaacaaaaa taactaatac taacatctca gagctcagg 60
aaatagaaac cgtctgaact atcctgcccg ccacatcctc agtcctcacc gccctcccat 120
ccctacgcat cctttacata acagacgagg tcaacgatcc ctcccttacc atcaaatcaa 180
ttggccacca atggt 195

<210> 389
<211> 183
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(183)
<223> n = A,T,C or G

<400> 389
taacactcac aacaaaaacta actaatacta nnatctcaga cgctcaggaa atagaaaccn 60
cctgaactat cctgcccgcc atcatcctag tctctcaccg cctcccatcc ctacncatcc 120
tttacataac agacgaggtc aacgatccct cctttaccat caaatcaatt ggccaccaat 180
ggt 183

<210> 390
<211> 473
<212> DNA
<213> Homo sapien

<400> 390
acaaagcagc aactgcaata ctcaaggtta aaacattaga aaagcatttg tgtgacaggt 60
atattacagt attatcaaaa tattacattt tcagacttac ttagcagata atcatccacc 120
agagcttaaa tcttttaaatt atttccatag tcttaaaaaa tatgtaatgt cagaatgcat 180
ataaaaagaa tgtaaaagga aacctaataa acaaatggaa taatgtaaca aataaatatt 240
tgatttcagt aactgttaat aatcagctca acaccaccat tctctctaaa ctcaatttaa 300
ttcttatagg aataatgaac tgtcaaatgc catggcataa ttatttattt ccaagctatc 360
atcaatgatt agaactaaaa aaaatttggc ataaaaaaat cacaattcag cataaataaa 420
gctattttta gcttcaacac tagctagcat ctctaagaat tggtgaaata agt 473

<210> 391
<211> 216

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(216)

<223> n = A,T,C or G

<400> 391

atttgtattt taggtttcct tttacattct ttttatatgc nntctgacat tacatatattt	60
ttaagactat ggaaataatt taaagattta agctctggtg gatgattatc tgctaagtaa	120
gtctgaaaat gtaatatattt gataatactg taatataacct gtcacacaaa tgcttttcta	180
atgttttaac cttgagtatt gcagttgctg ctttgt	216

<210> 392

<211> 98

<212> DNA

<213> Homo sapien

<400> 392

acttattttca acaattctta gagatgctag ctagtgttga agctaaaaat agctttattt	60
atgctgaatt gtgatttttt tatgccaaat ttttttaa	98

<210> 393

<211> 397

<212> DNA

<213> Homo sapien

<400> 393

tgccgatata ctctagatga agttttacat tgttgagcta ttgctgttct cttgggaact	60
gaactcactt tcctcctgag gctttggatt tgacattgca tttagacctt tatgtagtaa	120
ttgacatgtg ccaggggcaat gatgaatgag aatctacccc cagatccaag catcctgagc	180
aactcttgat tatccatatt gagtcaaatg gtaggcattt cctatcacct gtttccattc	240
aacaagagca ctacattcat ttagctaaac ggattccaaa gagtagaatt gcattgaccg	300
cgactaattt caaaatgctt tttattatta ttatttttta gacagtctca ctttgtcgcc	360
caggccggag tgcagtgggt cgatctcaga tcagtg	397

<210> 394

<211> 373

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(373)

<223> n = A,T,C or G

<400> 394

ttacattggt gagctattgc tgttctcttg ggaactgaac tcactttcct cctgaggctt	60
tggatttgac attgcatttg accttttatg tagtaattga catgtgccag ggcaatgatg	120
aatgagaatc tacccccaga tccaagcatc ctgagcaact cttgattatc catattgagt	180
caaatggtag gcatttccta tcacctgttt ccattcaaca agagcactac attcatttag	240
ctaaacggat tccaaagagt agaattgcat tgaccacgac tantttcaaa atgcttttta	300
ttattattat tttttagaca gtctcacttt gtcgcccagg ccggagtgca gtggtgcgat	360
ctcagatcag tgt	373

<210> 395
 <211> 411
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(411)
 <223> n = A,T,C or G

<400> 395
 actgatcatt ctatttcccc ctctattgat cccacacctc aaatatctca tcaacaaccg 60
 actaatcacc acccaacaat gactaatcaa actaacctca aaacaaatga taaccatata 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctcggaactc tgctcactc atttacacca accaccaat tatctataaa 240
 cctagccatg gccatcccct tatgagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccact tcttacngca aggcacacct acaccctta tccccatact 360
 agttattatc gaaaccatca gcctactcat tcaaccaata gccctggccg t 411

<210> 396
 <211> 411
 <212> DNA
 <213> Homo sapien

<400> 396
 actgatcatt ctatttcccc ctctattgat cccacacctc aaatatctca tcaacaaccg 60
 actaattacc acccaacaat gactaatcaa actaacctca aaacaaatga tagccatata 120
 caacactaaa ggacgaacct gatctcttat actagtatcc ttaatcattt ttattgccac 180
 aactaacctc ctcggaactc tgctcactc atttacacca accaccaac tatctataaa 240
 cctagccatg gccatcccct tatgagcggg cgcagtgatt ataggctttc gctctaagat 300
 taaaaatgcc ctagcccact tcttaccaca aggcacacct acaccctta tccccatact 360
 agttattatc gaaaccatca gcctactcat tcaaccaata gccctggccg t 411

<210> 397
 <211> 351
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(351)
 <223> n = A,T,C or G

<400> 397
 ngccgangta caaaaaaaag cacattccta gaaaaaggta ttggcaaata gtaaaaatgg 60
 gaggtcaaaa ncaaaaaaaa aaaaaacaaa acnaaaaaaa gaaaaaacca acaattcttc 120
 aattcagtg gcaaacatta tataaaaaata gaaatactaa ctctacaggc agtatttcct 180
 gataaattat ttaaatagca tatctacnca atctgagata tctattccaa tggcaatgag 240
 aaaataattt ataaaaataa agcaatggta taccanatga tagaaaaaaa cataactttc 300
 agaaattgta tttaacattt caatgctatt tctttattgn gaatncttct c 351

<210> 398
 <211> 363
 <212> DNA

<213> Homo sapien

<400> 398

acaaaaaaaa	gcacattcct	agaaaaaggt	attggcaaat	agtaaaaatg	ggagggtcaaa	60
agcaaaaaaa	aaaaaaacaa	aacaaaaaaa	agaaaaaacc	aacaattctt	caattcagtg	120
tgcaaacatt	atataaaaaat	agaaatacta	actctacagg	cagtatttcc	tgataaatta	180
tttaaatagc	atatctacac	aatctgagat	atctattcca	atggcaatga	gaaaataatt	240
tataaaaaata	aagcaatggt	ataccagatg	atagaaaaaa	acataacttt	cagaaattgt	300
atttaacatt	tcaatgctat	ttccttattg	ggaatacttc	tctgcagagt	ttttatgcta	360
tgt						363

<210> 399

<211> 360

<212> DNA

<213> Homo sapien

<400> 399

actgtttcct	cgtgggttcag	gggtgtgcat	gaaggctctt	aggagagcaa	acacctgttc	60
ctattctgta	tgtccctccc	tcatttcaaa	tgagagtaac	caattgagta	aaataaccaa	120
ataaccattg	ccccaccatg	aacatggggc	ttgggaagac	agtcctacaa	tcttcatcat	180
atatttaggt	ttttaggcca	gccagctctt	tttttccaaa	gctttctttt	gaataccgcg	240
ccgggcggcc	cctaaggggc	aattctgcag	atatccatca	cactggcggc	cgctcgagca	300
tgcattctaga	gggcccatt	cgccctatag	tgagtcgtat	tacaattcac	tggccgtcgt	360

<210> 400

<211> 87

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(87)

<223> n = A,T,C or G

<400> 400

ctgcacatat	cnattacact	ggcggccgct	cgagcatgca	tgnagagggc	ccaattctcc	60
ctatattgag	tgaattaca	atncnct				87

<210> 401

<211> 328

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(328)

<223> n = A,T,C or G

<400> 401

accaggggac	acaaacactc	tgcttaggaa	aaccagagac	ctttgttcac	ttgtttatct	60
gctgaccttc	cttcactat	tgtcctatga	ccctgccaaa	tccccctctg	cgagaaacac	120
ccaagaatga	tcaataaaaa	ataaaataaa	attaaattaa	aaaaaaaaaa	agagaggaac	180
ccacaaaaaa	aaaaaaaaag	aaagtntata	aaataaaata	ttgaagtcct	ttccatttaa	240
aaaaaaaaaa	aagaaaaagc	acggactctt	tcattccagtt	ctgatgtgat	tatctctgga	300
aggcattttc	tcctcctctt	ccctcccc				328

<210> 402
 <211> 268
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(268)
 <223> n = A,T,C or G

<400> 402
 nacataatga caacatcttc actagactga gtgttcaagg atttgagatg attcgctatt 60
 catcacaccc cgaagattga gatccactgt atttacacaa agcaaagcca tgtcagcaag 120
 ggactgtcaa cctgattctg agaacataaa cattcaaaat ttattttcca gtgttctctt 180
 ttggaaacca acaacacatc tttaatacct acacacacac acatctntac ctttaaaaaa 240
 aaaaaaaaag tгнаacttca cagatagt 268

<210> 403
 <211> 538
 <212> DNA
 <213> Homo sapien

<400> 403
 acagtqatag ctccccctgg gcaatacaat acaagaacag tgggttttgt caaattggaa 60
 caaggaaaca gaaccacaga aataaataca ttggttaaca tcagattagt tcaggttact 120
 tttttgtaaa agttaagta gaggggactt ctgtattatg ctaactcaag tagactggaa 180
 tctcctgtgt tctttttttt tttaaattgg ttttaatttt ttttaattgg atctatcttc 240
 ttccttaaca tttcagttgg agtatgtagc atttagcacc actggctcaa tgcgctcacc 300
 taggtgagag tgtgaccaa tcttaaagca ttagtgctat tatcagttac caccatttgg 360
 ggctttttatc ctccatgggt tatgatgttc tctgatgac acatttctct gagttttgta 420
 attccagcca aagagagacc attcactatt tgatggctgg ctgcatgcag acatttaaag 480
 ctttttagaga atacactaca ccagggagta tgactactag tatgactatt aggagggg 538

<210> 404
 <211> 310
 <212> DNA
 <213> Homo sapien

<400> 404
 tttttttata gatacaattg gctttttatt gtgattcatg agtcagggca gtttccattc 60
 tgcaaaatat agtgatagct cctactgggc aatacaacag tagaacagtg ggttttgtaa 120
 aatgggaatc caggaacaga agaataataa taaattgatt taaataaact gattgggttaa 180
 tttcagaata ctccatatta cttttttcta agagttaaag cagaaaggac tttcttactg 240
 tgctgactca gacagcctgg actctcatgt ttttaggaaa attttgtctg ttctgggac 300
 tacctgcttc 310

<210> 405
 <211> 559
 <212> DNA
 <213> Homo sapien

<400> 405
 acaaatcaca attattaact cactggtagg gcagtgatga tcaaaccaat tgcattcatc 60
 catgctgtaa tgttctctct tggcactaaa ggctgactgc agccggcaaa aaagaatgta 120

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agtatgaatt tataaaaaaca ttttagatgg ctgacaacgg atcttatttt taaagaatat 180
gtctaattca gaggatcgac aactaatcca ttccaataaa acaatgggga attttttatt 240
gaataaaaaat gtaatatgca taaaaactca agaaggcttt ttaaaaaatac ttctcccca 300
atcattatcc catacttcat gctaattttt aaaagaatct tgaaatcttg aaaacaagat 360
gaagagaatc ttgttttaag tgacaagtta acattattcc tatattaaat gtcaaactgc 420
tattaatgag tagaagtagg aacaaacccg gatcttagga tctgtccag ggctcattcc 480
ataactccta tatcaciaag acaagatctg gaaccagaaa acagtcatca tccaatgtgc 540
atcagccttg cggaacag

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<210> 406
<211> 427
<212> DNA
<213> Homo sapien

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<400> 406
acaacagaat atctcgggaa tggactcaga agtatgccat gtgatgctac cttaaagtca 60
gaataacctg cattatagct ggaataaact tttaattact gttccttttt tgattttctt 120
atccggctgc tcccctatca gacctcatct tttttaattt tattttttgt ttacctccct 180
ccattcattc acatgctcat ctgagaagac ttaagttctt ccagcttttg acaataactg 240
cttttagaaa ctgtaaagta gttacaagag aacagttgcc caagactcag aatttttaae 300
aaaaaaaaatg gagcatgtgt attatgtggc caatgtcttc actctaactt gggtatgaga 360
ctaaaaccat tctcactgc tctaacatgc tgaagaaatc atctgagggg gagggagatg 420
gatgctc

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<210> 407
<211> 419
<212> DNA
<213> Homo sapien

```

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<400> 407
acaatttgta gttgtttcca ggtttgctta ataatcattc cttaacctag aattcagatg 60
atcctggaat taaggcaggc cagaggactg taatgataga attaaattag tgtcactaaa 120
aactgtccca aagtgtctgt tccctaatagg aattcattaa cctaaaacaa gatgttacta 180
ttatatcga agactatgaa tgctatttct agaaaaagtc tagtgccaaa tttgtcttat 240
taaataaaaa caatgtagga gcagcttttc ttctagtttg atgtcattta agaattacta 300
acacagtggc agtggttaaat gaagatgctg tctacaaggc agataatata ctggttgata 360
ctcaaaacat ttttcatttt gtttaaagta gaagttacat aattctatat ttttaagtct 419

```

```

<210> 408
<211> 523
<212> DNA
<213> Homo sapien

```

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<220>
<221> misc_feature
<222> (1) ... (523)
<223> n = A,T,C or G

```

```

<400> 408
acatttgatg ttatgtgaat gttgagtttt tttcttctaa ttttcacttc agcagtgttt 60
agggcctttca gatgccttat tccagtgtga acagaaaaag ttcatatttt atgtgggttaa 120
tgctttgatg tgtcacataa agagtgttt gtagaaaatg ttggcacaat ttttaacttct 180
tagtggcttg tgacattata tattatatat atatgtatat atatctttat aacattcctg 240
tgtttagtag tgtaaatgtt ctgggcaagt tttaatattt tgaatgcctt tggatattcc 300
agcaataaag gcatcatgtt ctgcaatagg atttcttact catttaccta ttttaacact 360

```

```

aaaatagacc acaactgagc acaaattcct tttataaatg ttatagaagc agggaagaat    420
aataaacaca tttgtgaatt gtggttcagt ttatttatct ttagggaagg ctgatacatt    480
atcttatagc acataacccc agcctcttat tcattatggn taa                      523

```

<210> 409

<211> 191

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(191)

<223> n = A,T,C or G

<400> 409

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accccgtagt gatgagcact gactggttca ctggccacat tttagttctt cataataata    60
ggccacaaaa gggctctgtg gtttgccctcc atgtgcactg gcccctcccc acccctaggg    120
ggcactcagt agctgctgag aaggcctgtc cacgangctg ttggaacccc ttcaataaat    180
acttagaagn a                      191

```

<210> 410

<211> 403

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(403)

<223> n = A,T,C or G

<400> 410

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acactggcca gtgtgttttt ggcgattaaa cataatcctg tgaatcagat taattcactt    60
gctgagtgtt catttgccgc atccctctgt tgggtcttgg gggccctcca cgacctcgtg    120
gggctccccg tggteccactc tgcccagagc ctgccttgaa attctgctga tateccatccc    180
gttgatagcc agagtaatcc cggggagcac tgaactgaga ctgtgtataa ccactgtttg    240
gagtgttaga gaatgaaggg cggttaacat catatcctcc tctgaatcca ttggcagggc    300
cccggtatcc attcatcaag cctctagcac cacgggagcc tccacgagac acaccacgac    360
tattgtaata gggctgattg ctacgtggaa atccagtgn tctg                      403

```

<210> 411

<211> 384

<212> DNA

<213> Homo sapien

<400> 411

```

acgtgaaatc ataacaacat gttctcttgt gtttggcttc tcttgctcag catgatattt    60
ttacggttca cccatattgc atgtatcagg aatataatcc tttttattat tgagtagtgt    120
tctattgtat gtatatacca cagtttattt ctcccttcat cctttgctag attttggggg    180
tttttcacat tgcgctattc aagtataaac ctgctctcaa cattcatgtg caagtctttg    240
agtggacata tatttgccgt ttctcttgag tgaatgcacc ttgttgggtc acgtggctta    300
atttaaaaaa attttaatca ctgtggtgca tatgtagtga ttattagtga ttatctcata    360
attttatttt cttgatgact aatg                      384

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<210> 412

<211> 315

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(315)

<223> n = A,T,C or G

<400> 412

acaatatttc	tcctttgaga	agataggata	tatgattttc	ccaaaaatca	caactttgaa	60
ggaagactta	nttgctgact	tcaattatat	cctggaactg	gcaacttggt	cccttccttt	120
gcttcaaaaa	aagtgttaaga	aagagtgata	agatcaactt	taatcattct	tggatcttca	180
gcaaattcag	gatcaatgta	gaaaaacact	ggcatatcta	cttcctcttg	gggattaagc	240
ctttgttctt	caaaacagaa	gcactgtatt	ttattgaaat	actgtccacc	ttcaaattgga	300
acaatattgt	atgna					315

<210> 413

<211> 554

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(554)

<223> n = A,T,C or G

<400> 413

acaggtttca	ctatracaaa	tatatgatgt	taaactaaca	aacctatgac	cttcaaagat	60
gtcttcgtcc	cacgcacaca	catttgtaat	ttgtgtccat	ttgctatttc	cctttcttcta	120
taatcttcaa	attatatagt	tatgcattga	gttccttatg	catctcacc	atctccttta	180
tctcagcctt	ctcatacttt	gccattctct	tctttctgga	aataaccagc	acaacaattc	240
cagcaacaac	tgctatcacc	acaaccacaa	taacagcaat	aaccaccagct	tttagaccct	300
gcattgagaa	ttcaggtgct	ttttcatcaa	cataataaat	taaagtttga	ccaggatcca	360
gateccagttg	ttccccattt	actgtcaggt	gccattttct	tagaatgaaa	caaggattca	420
cctttaacat	ctttttcaaa	ataataagcc	acatcagcta	tgtccacatc	attctgagnt	480
ttttgagaag	aattttgaac	cagatcaata	gtgataacat	tattctcata	caaaatactc	540
gngataaatt	ntgg					554

<210> 414

<211> 267

<212> DNA

<213> Homo sapien

<400> 414

accagaaagg	cacacgattt	tacaatattt	gttggaatta	ccttactttt	taacctcttc	60
atagcagttt	tggtttgagt	atattgatga	aagccaaagt	ctgggtatcta	aaacttgggc	120
caatgtttcc	caactggtat	atgtcaggct	ttcccaatag	cttaactgtg	accctatacg	180
gatggctttt	tagatagttc	tatactgctg	tattgtgtta	gcacttttct	ttgtcattaa	240
caacacactt	taaatgacat	ttggtga				267

<210> 415

<211> 454

<212> DNA

<213> Homo sapien

<400> 415

accggaacct	gcagaaacag	tgtgagaaat	taagtcctgg	ttcactgcgc	agtagcaaag	60
atggtcaagg	ccatggaaaa	agcagaaatt	taccaagaaa	gctgataccc	atgtatagtt	120
cccactcatc	tcaaatacat	ctgctatctt	tttaagctaa	gtcctagaca	tatcggggat	180
aacatggggg	ttgattagtg	accacagtta	tcagaagcag	agaaatgtaa	ttccatattt	240
tatttgaaac	ttattccata	ttttaattgg	atattgagtg	attgggttat	caaacaccca	300
caaactttta	ttttgttaaa	tttatatggc	tttgaaatag	aagtataagt	tgctaccatt	360
ttttgataac	attgaaagat	agtattttac	catctttaat	catcttggaa	aatacaagtc	420
ctgtgaacaa	ccactctttc	acctagcagt	atga			454

<210> 416

<211> 370

<212> DNA

<213> Homo sapien

<400> 416

ccgacacggg	gccagcgccc	tgctgcgtgc	ccgccagcta	caatcccatg	gtgctcattc	60
aaaagaccga	taccgggggtg	tcgctccaga	cctatgatga	cttgtttagcc	aaagactgcc	120
actgcatatg	agcagtcctg	gtccttcac	tgtgcacctg	cgcgaggagac	gcgacctcag	180
ttgtcctgcc	ctgtggaatg	ggctcaagg	tcctgagaca	cccgattcct	gccccaaacag	240
ctgtatttat	ataagtctgt	tatttattat	taatttattg	gggtgacctt	cttgggggact	300
cgggggctgg	tctgatggaa	ctgtgtattt	atttaaaact	ctggtgataa	aaataaagct	360
gtctgaactg						370

<210> 417

<211> 463

<212> DNA

<213> Homo sapien

<400> 417

acactttata	tattccaaat	tgatcagata	tatggtttgc	aaattcatct	caatctgtag	60
cttatctttt	cctcttctta	aatcacaagt	ttttaaat	tgaagaagtc	caatatatca	120
gattttgtct	tttatggatg	tgctttcggg	gcaaagtcca	agaacttgct	acctagccca	180
agatcctgaa	gatttttctc	ctgtggcctt	tttcaaagtt	atctagtttt	atgtatcaca	240
tttaagtccg	ttatacat	tgagttaaat	tttatataag	acgtgaggtt	taagtagagg	300
ttcttttttc	tccctcgccat	gggtgtctaa	ttgctctagc	ataatttgct	agaaaggcta	360
ttcttctctc	attgaattgc	tttttcaact	tttcaaaatc	agctgagcat	atttatatgg	420
gtttatttct	gggttctctc	atctgttcca	ttgacgtatg	tgt		463

<210> 418

<211> 334

<212> DNA

<213> Homo sapien

<400> 418

ttagcatttg	cttttat	tttactttga	tgccttttca	aattggcatg	tctttaaagt	60
atttttcttc	ctgattaaaa	atgtgtgtgt	atgtgtgtgt	gtgtgtgtat	atatatat	120
ttttaaatca	cattaatttt	accaagtga	accaagccat	actgtttttg	agccaattaa	180
gaaaattgcc	attttttaaag	tgtagcattt	cagggtaaaag	acccatgaaa	tggcttgatg	240
tattctagac	tactgaaaga	aaaccacttc	aaagattttg	ttgaaagttt	tagtgtgtgc	300
tgaaatgcaa	gagggaaggt	gattggtagt	gagt			334

<210> 419

<211> 297

<212> DNA

<213> Homo sapien

<400> 419

acttctttga ccaaggaata ccacagacac cctaccgata gaacagtggc tcagatctta	60
cttgctcctg cttacgaagt attcccaatc actggtcacg tgaccctact tgaacactcc	120
tgaacagtca tgttttttaa aatcttcctt tatatcaagt cagagagtat acttctataa	180
atttactca tggatgttag gaaatctagt catcttcctt gtgattgccc tgttaagtat	240
ttaaccatag ctatcatgtg tttcccaaat cttctctaga ttaaataatct tcagtta	297

<210> 420

<211> 418

<212> DNA

<213> Homo sapien

<400> 420

acgagaggaa ccgcagggtc agacatttgg tgtatgtcct atcaatagga gctgtatttg	60
ccatcatagg aggcctcatt cactgatttc cctattcttc aggctacacc ctagacccaa	120
cctacgccaa aatccatttc gctatcatat tcatcggcgt aaatctaact ttcttccac	180
aacactttct cggcctatcc ggaatgcccc gacgttactc ggactacccc gatacataca	240
ccacatgaaa tatcctatca tctgtaggct cattcatttc tctaacagca gtaatattaa	300
taattttcat gatttgagaa gccttcgctt cgaagcgaaa agtcccaata gtagaagaac	360
cctccataaa cctggagtga ctatatggat gccccccacc ctaccacaca ttcgaaga	418

<210> 421

<211> 304

<212> DNA

<213> Homo sapien

<400> 421

acgcctggac ccctgtgact tgcagcctat ctttgatgac atgctccact ttctaaatcc	60
tgaggagctg cgggtgattg aagagattcc ccaggctgag gacaaactag accggctatt	120
cgaatattat ggagtcaaga gccaggaagc cagccagacc ctccctggact ctgtttatag	180
ccatcttctt gacctgctgt agaacatagg gatactgcat tctggaaatt actcaattta	240
gtggcagggt ggttttttaa tttcttctg tttctgattt ttgttgtttg ggggtgtgtg	300
gtgt	304

<210> 422

<211> 578

<212> DNA

<213> Homo sapien

<400> 422

actgtgcagg cagattcaca ggggtggtgt aaagcatcca caatggctct ggcagcatca	60
ggatcacact tgaaggggct ctcagacaaa gttgtattca tgcaactgat tccttttcca	120
ttcgttttct tagtcaactaa tgctttccaa tggatcatgag tgcttttaaat aatatcaatg	180
gcaaagtcct tatctttaaa ttctgcatta aacgcaaact cattttctgg ttttccatca	240
ggaaccttat accttctaaa ccagtccaca gtagcttcta agtagccagg ttccagccgt	300
ttgacatcat tgatatcatt ataattggct gcatcaggat catccacatt aatggcaatg	360
actttccagt cggtttcccc ttctgcaatc atagccaata tgcctagaac tttcaattat	420
ttatttcacc tcttgccatc accttgcttc caatttcaca cacatcaatt gggtcattgt	480
caccacaaca gccagtatgt ttatcattgt gccctgggtc ttcccaagtc tgagggatgg	540
caccatagtt ccagatatat cctttatagc ggaacaaa	578

<210> 423

<211> 327

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(327)

<223> n = A,T,C or G

<400> 423

acagtatatt	tttagaaact	catttttcta	ctaaaacaaa	cacagtttac	tttagagaga	60
ctgcaataga	atcaaaat	gaaactgaaa	tctttgttta	aaagggttaa	gttgaggcaa	120
gaggaaagcc	ctttctctct	cttataaaaa	ggcacaacct	cattggggag	ctaagctagg	180
tcattgtcat	ggtgaagaag	agaagcatcg	tttttatatt	taggaaattt	taaaagatga	240
tgyaaagcac	atthagcttg	gtctgaggca	ggttctgttg	gggcagtgtt	aatggaaagg	300
gctcactgnt	gntactacta	gaaaaat				327

<210> 424

<211> 384

<212> DNA

<213> Homo sapien

<400> 424

acgaaaaata	aatctcctta	aaaactaaat	aaaatgcact	gtattcttac	agttaatgtt	60
tataactata	gtaaaaaatt	aatatatatc	ctattacata	aatgttat	cttaggtgtt	120
ccattaagaa	gagcaataga	ataatgctaa	aaaataatgc	ctataaatct	tcagagtata	180
aagacatcca	ttcagaaaca	aaaattagca	ctaaattttt	tataaaatag	accagatgac	240
aaaattttatt	ttatttttaa	acagtgggtt	tgacacaaat	tatgttattg	aaaagcatta	300
ttaatgttta	atatttttaa	aattttggaa	tttgccattt	ctcagagaat	gatcaggcct	360
taggaaatta	atacagtagt	agta				384

<210> 425

<211> 255

<212> DNA

<213> Homo sapien

<400> 425

actatcaggc	tttgtgctga	tttctgaac	aaactgcatt	atattatgaa	aacaaaagga	60
aaagaagaaa	taataaaaaac	tatactccca	tatttcactt	acagtgtttg	agttcctgga	120
aggacctata	taatggaggc	agcattcaaa	caagaaatta	tgccaatcaa	ctgtcaaatt	180
ttcactataa	ttttcctaaa	aaggcgtttt	tcccccaata	tctattaatc	tcaaagaaac	240
ataagtgtg	aatgt					255

<210> 426

<211> 196

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(196)

<223> n = A,T,C or G

<400> 426

acatgaantn	nccaggccca	cacagccaga	cagcaacaga	accaagacct	agggctcttc	60
actcctgtta	catcacacca	tggcaatgat	tttacattct	ccaactgatt	caaatcatat	120

ggcagctagg gatttggggg ctccatgttt tatttcaatt gcaagttcaa gatttctttt 180
 tatctttgtg ggctga 196

<210> 427
 <211> 163
 <212> DNA
 <213> Homo sapien

<400> 427
 acagaagatc catggaggca agtgctgtca ggaaggacac tgcctccctc caccctccca 60
 aatgtcacca ccaagttcct tcaggtgaga cctcacacaa tgtcaagtgc tttctaggaa 120
 atactaagat caggttgaga gattctgctt ggtctagtca atc 163

<210> 428
 <211> 315
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(315)
 <223> n = A,T,C or G

<400> 428
 nactgagtan agatgctggg gaatgtgcaa tatgccttga agaattgcag cagggagata 60
 ctatagcacg actgccttgt ctatgcatat atcataaagg ctgcatagat gaatggtttg 120
 aagtaaatag atcttgccct gagcacctt cagattaagc gtcagcttcc tgttttatag 180
 gttttcttgt cttgacaaga tgcttgaaaa accaagagga tatgaaaatc tgtctctgga 240
 gaaacaaaga cgcaggcata ctgagccaga aatctgagtt ttgtgagact tggtaataca 300
 gagatggaca atcgt 315

<210> 429
 <211> 131
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(131)
 <223> n = A,T,C or G

<400> 429
 acagttaggn actagaacat ttgttaagcc tcccaaagta gngtgcattg aagattctag 60
 agtgccagc tcttgacta caaatgtaat aataacagaa taaatacact taccctgatg 120
 atattgaggg t 131

<210> 430
 <211> 503
 <212> DNA
 <213> Homo sapien

<400> 430
 actgattttt aataaaaagaa ataaggttca aagtttagca caacaacaca gcaataagaa 60
 gctgacaact tggataaaaa tacaagaaag taacacagag cccaggctac ccattattta 120
 ctgtgtgcat acaggaatgc tatacttcag atgtataaat tagagactga ttttaagtta 180

ttaatttaac	tactttttgt	ccactgtgct	aaactaaatt	ttataactaat	gtgctactgc	240
gtaaacactt	caaagcaatc	ttcattaaaa	tgctgcaaag	aaaaacaaga	atacacatca	300
tccaaaacta	aggatgtcat	tgcatgtcac	agtttgata	ataaatacc	tccctttcaa	360
tcactactaa	gatcactaca	tcctatctac	tcatcagcac	aaccttgaag	caacttatac	420
ttacaaatat	tagcaatgca	gccaaacatt	tgttttttgc	aaagcaacta	gtaaaaatca	480
agaattttta	ttaagacggt	gca				503

<210> 431

<211> 207

<212> DNA

<213> Homo sapien

<400> 431

acaagtgtgg	cctcatcaag	ccctgcccag	ccaactactt	tgcgtttaaa	atctgcagtg	60
gggcccggaa	cgctcggtggc	cctactatgt	gctttgaaga	ccgcctgata	atgagtcctg	120
tgaaaaacaa	tgtgggcaga	ggcctaaaca	tcgccctggt	gaatggaacc	acgggagctg	180
tgctgggaca	gaaggcattt	gacatgt				207

<210> 432

<211> 485

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(485)

<223> n = A,T,C or G

<400> 432

aaaaaaagta	atggaaaaat	ggttgcaggt	ttaatcncaa	aangaactta	atcttngtng	60
atcttggttt	atctgctaaa	acactaatat	ctataaatac	gaactgacag	catcgttcta	120
aatttacttc	tgaagagctg	tcgagacttc	aataaaatat	aagcaagtta	ctggatcata	180
tttatggact	gctgaattaa	ctacccgaaa	agtatcagtt	actttcaaag	aacacaaaac	240
aaagtgaacg	tggaaaaaag	ccttctttgc	aaaagtcctt	ttattagtec	tatcctctaa	300
aattccaagc	cacagagcct	tgatattcct	ggattctggt	ttaagtaacc	ttagttttta	360
atatgacact	tgggatatgc	acaatgggaa	agggtaggat	atgtgaacaa	aatttaattt	420
cttttttcca	aaggnagnca	ttttctttta	atncatccta	tccacttttg	cccacttccc	480
catgt						485

<210> 433

<211> 280

<212> DNA

<213> Homo sapien

<400> 433

actgtcacta	caatattaca	ttctgcaaat	gttattctgt	tgtatcagat	acaaaatttt	60
agtgaggtat	ctctaaggca	catagtagaa	aacaaaattg	gttaattact	caagttcctt	120
tcactgtgat	ttggaaatga	tttaatcttt	atagaatgag	aacctttttt	ggactagctt	180
ttttattaaa	atggctcaat	ttgtgttgat	aaggattgca	ttaatattta	atagtgtctg	240
cttttcctct	gggcacacca	ttttgatcat	taaccagagt			280

<210> 434

<211> 234

<212> DNA

<213> Homo sapien

<400> 434

ctttgctgcg	catcagggtgc	tttaagcttc	ggaacaactg	tgcaggattc	tatttttagta	60
ttctggaagc	atcattgagg	aagtagtcca	gtgaagttag	ctctaaaaaa	actctttact	120
ctaacaatta	aaagaaatat	gccaaaggat	ccataaggga	tgaataaatt	attaaactat	180
taagaagttg	ctataaatat	gcagtgttaa	ttcaataatt	cataacggac	tggt	234

<210> 435

<211> 330

<212> DNA

<213> Homo sapien

<400> 435

acctcccgtg	tcaccagttc	ccacagaagc	actgcaaaac	tcacatgtc	tgtgagcgt	60
ctgtttgtgt	cttcagggtt	cttctgcaga	gtctcggggg	ctaccaggc	aggtgcatac	120
atgcgaccag	gacattggaa	agagaacttg	acatcagcca	tgctaattcg	ggcagtcag	180
tcctcatcaa	tcattacact	acggctattg	agtgcattgc	gtgggatgag	gggtcttagt	240
gtgtgtagga	aagccatgcc	ccttgccatg	tccaaagcaa	acttcacagc	ctggctctgg	300
tcacgacga	aattggtgcc	ttcatgtagt				330

<210> 436

<211> 311

<212> DNA

<213> Homo sapien

<400> 436

acaactttac	aatggaattg	tatttcaatg	attattttga	tatcagatta	aaccttccaa	60
aaagttacac	ataattcagg	tctatttttt	ctaccagtaa	gagttctgct	aaattacaaa	120
accccataat	cacagtgttc	agtttttaaa	aaattaaaca	cacagtaatc	ctgtcaatgt	180
taatcaaaat	caaaacttcg	gaatgccgtg	gcatttatgt	gaccaatctg	agtttttagat	240
acaaatacca	gctgtttatc	ccatgaacca	tttttcctag	gctgaggctg	tgaaaaatcg	300
aaagtcggcg	t					311

<210> 437

<211> 355

<212> DNA

<213> Homo sapien

<400> 437

actagtggat	gggggtcagg	gtgtcaactcc	aaggccctct	acagaccag	agaagaggaa	60
agtcaaaaaa	gccagatatg	agactgctga	agtgggtgta	agaaatatag	gcaaggtaaa	120
gggaacaaga	tctgggctcc	ctcctacttg	tgtccctcac	tggaacctag	acaccctacc	180
tctaagactg	gttcttagaa	ggctgaacag	taaggagcat	tccaatagct	tctgaaactc	240
ccaaggctgt	ttcaagtagt	cgaaagccat	ccctggactg	ttcagggtgcc	ttttctatct	300
cccacctgag	ctctctgccc	tttcttttag	cctcacaggt	ttccagaatt	acagt	355

<210> 438

<211> 431

<212> DNA

<213> Homo sapien

<400> 438

acagtaactt	taactttaca	tagagctgag	ataaaaaataa	agctttctta	caaattacat	60
tttttttcca	gtgaattact	tttgagtaa	aaatagctgc	tacataaatc	cctcctgate	120
tctgaaaagg	agttgcatat	ttccaaaaat	aatattctta	ttttaatcac	acagaagaac	180

gtggagcaca	ggaaggaaat	ggctgggtgg	tcagagagag	gtgagctgtc	ggagaaacac	240
agttaaacta	aaaaataaaa	tccattttgt	gtataaaactg	acttaaacgc	atgcaaagaa	300
gtggaaaaca	tatgccattt	gtcaagaaaa	atactgcttt	atagctttta	ctttacaatt	360
aaaggagaaa	gcagaggcca	gatataagcc	cagataataa	catttaagtt	tctcataaaa	420
ctcccaaattg	t					431

<210> 439

<211> 170

<212> DNA

<213> Homo sapien

<400> 439

actgtcataa	aaaacagtgg	agctctgtat	tagaaagccc	ctcagaactg	ggaaggccag	60
gtaactctag	ttacacagaa	actgtgacta	aagtctatga	aactgattac	aacagactgt	120
aagaatcaaa	gtcaactgac	atctatgcta	catattatta	tatagtttgt		170

<210> 440

<211> 400

<212> DNA

<213> Homo sapien

<400> 440

acgtaaaaag	aacatccctc	ccatcttcaa	ggtcaagatt	gaacgctgac	tcctgcagga	60
agtcttccag	gattcccagg	caggaatgat	ggctccctgt	ccctgtagct	ccaggagttc	120
ttgcttcacg	cacgcctcac	ataccagact	gaatgttygc	aggaggagtg	accagggtcg	180
tcactctgtg	ccctaccacc	tacaacaygc	cagcaatcta	cccgtgtgtg	tttggtggac	240
agaattaacc	atgatgggcy	gccgagggcg	cctggagcta	tttgggggct	tggagagaac	300
ctcttaggag	agtgctcagg	tctaggccag	tgtcaccaga	ggaggtcagt	ctcagtcctt	360
ggagtgggtg	gatggaaacc	agacgggact	ggcatggtcc			400

<210> 441

<211> 204

<212> DNA

<213> Homo sapien

<400> 441

acctagttac	ttcttaagat	caggtgtata	aaactgtgga	gtggagcggt	atggtatgga	60
atgacttgga	atgtaagctg	tcaggagaaa	aatgttgcta	cacttttgct	aagatctggg	120
ggtttcttca	tattcctgct	gttggaagca	gttgaccaga	aatgcttgcc	agtactgcca	180
aagcactgct	gtgaaatgtg	aagt				204

<210> 442

<211> 649

<212> DNA

<213> Homo sapien

<400> 442

acatttaatt	ttttacaaca	ttttctccct	agagatataa	tttagatatt	cctatcttca	60
aagtaaaaat	caaaatagga	aataagcata	gaaacagcct	attggcagtg	gttacacctg	120
catggtatth	atgagtcctc	aaactattgg	aaatttattt	caaccaaggt	tctcttaagt	180
cttcattact	tgggtgtaac	tcgagagaaa	actaatttat	atcaatttac	agtttagtgg	240
tcatgatcag	gggaaagtga	tactcttcca	ctgactacaa	gtcattgcag	aggcagttta	300
gaacttttcc	tttattccta	atatacagga	caaaccttgc	cgacatctca	ctacctcaaa	360
aatcaaatth	aaatgaagta	tccaggagta	gcctaaagaa	tgagtgtaat	ctggatggat	420
tttagtctaa	atttatgcct	tgctcttcag	taaagtatag	taactccaga	tatatgttcc	480

acagatgcaa taatttctgt tccttggtcg gtgcagaata taatttatac ttcctgaaat	540
caactttgtc tattcatgaa aatagctgct ttttatttgc ctttgtctca ctttgaatat	600
atatgatcca caggttacag acttttccaa taactacatt tcaacttgt	649

<210> 443

<211> 346

<212> DNA

<213> Homo sapien

<400> 443

acgtgggatt gaaatgcaca tacatgtttt tgctaagagc acatacattt cattctcctc	60
actttgttca taacctcagc attgtcagat aacctcagtg agttaactca aagcctttta	120
ttatggaaaag aactggcaca gttacatttg ccagtgggcaa catccttaaa aattaataac	180
tgatgggtca cggacagatt ttgacctag ttcccttttc ttttagagca aaaagaactt	240
ttacctcggc atccagccca acccctaaag actgacaata tccctcaagc tcctttgaaa	300
gcaccctaaa cagccatttc cattttaata gttggatgcg gattgt	346

<210> 444

<211> 425

<212> DNA

<213> Homo sapien

<400> 444

accaatttcc ttttacagta aaggggcttt tcttggtgct tgttgaaccg gttcccagct	60
gccattacc accaagccca aaagagtaaa ttcttcttga tgaagyaaca aaagcagaag	120
tgtgtgcccg tccacaagca atctcagtga caatgcttcc cataagttca aaaactttcc	180
ttgggtttat ttcatgactg gtagaattat ggcccaactg accataccct ccagctccaa	240
aagtaaacac tccaccttcc ttgggttagag cagcagtatg atcttctcca caacaaatat	300
aaactatttt ctgagatctt agtgacttta gtaaattagg aacataccta tcattttcat	360
cattaagacc tagctgacca aacttggtgc gtcccatcc aaagatagct ccagaaaggg	420
tgagt	425

<210> 445

<211> 210

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1) ... (210)

<223> n = A,T,C or G

<400> 445

nactgtccca atataaaaca gtaattattt gacctttgca ctgtttgtct ggctcttttc	60
agtttgattg catataaatg tggaacttga tagatctcta tatttttaat gcacttgtga	120
taaactggca gcagggttag acattacttt caaagcttga ggtagaccga gtcagcatgc	180
tagacaggct tctctctcta accaaaactg	210

<210> 446

<211> 326

<212> DNA

<213> Homo sapien

<400> 446

tcgaaagacc cctgtaaaag agcccaacag tgaaaatgta gatatcagca gtggaggagg	60
---	----

cgtgacaggc	tggaagagca	aatgctgctg	agcattctcc	tgttccatca	gttgccatcc	120
actaccccg	tttctcttct	tgtgcaaaa	taaaccactc	tgcccatttt	taactctaaa	180
cagatatttt	tgtttctcat	cttaactatc	caagccacct	attttatttg	ttctttcatc	240
tgtgactgct	tgtgactttt	atcataattt	tcttcaaaca	aaaaaatgta	tagaaaaatc	300
atgtctgtga	gttcattttt	aaatgt				326

<210> 447

<211> 304

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(304)

<223> n = A,T,C or G

<400> 447

ncntcnaggt	acatgctaga	agtctgatgt	ngtnngtaac	acagaaacat	acacagtctt	60
catattcaaa	gtcttcacng	ggatgtcggt	ctgtaatttc	ctgcgttttg	gtctcttcca	120
gaaacagctt	tagcttcctg	ctccgaaggc	caaacacctt	ggctgcttca	tacagaagac	180
cttggtgggt	gagtccattc	tgcccaagtg	ggttttcaag	caggagagtg	cccactgtcc	240
ccattaaaca	ctcttggtgg	tttgcatcca	ggagctgtag	gttgatatac	tgacaaggaa	300
gagt						304

<210> 448

<211> 203

<212> DNA

<213> Homo sapien

<400> 448

acatgaaagc	ggcaatgcgg	taaaaagcga	attcttacct	aaggctagaa	ttttttatta	60
agcgcatttt	cattagttag	acaaacaacc	ttataaacct	ttatgtcaaa	ccatataatg	120
tgaagaatct	ccatgggaga	gatttttttt	cacccttcag	aattatcttt	ttcccctaag	180
accttcatat	gaatcttctt	tgt				203

<210> 449

<211> 481

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

<222> (1)...(481)

<223> n = A,T,C or G

<400> 449

acttgttcta	taatactctg	atgtttcctt	aaattcctga	acaacattct	gtttactaaa	60
tttcttttct	tcctttattc	acaccaaatt	ccaccctata	atagaagcta	attatttcag	120
aaagcttttt	agtgatcatt	tattactttg	tgtttactag	atattaattc	taagatgaat	180
tccttttagaa	tttttagaaaa	aattattcta	gacaacaatc	aaagtaaagg	atacatccag	240
cattgaaacc	ataagccggc	aagtctccag	gttaaaaagg	ttgtatcctc	cagcaatgcc	300
agactgtgtc	agacatctct	gcaattcatc	agcatctatc	tgcccatcct	gtccagctac	360
agcagcaaag	taaccataca	gcggatcctg	agtttgtccg	ggaaacgcag	gccctccggg	420
agccccctca	tactgcattc	tgagttgaag	tcttatangt	agaagctggg	gataccttaga	480
g						481

<210> 450
 <211> 296
 <212> DNA
 <213> Homo sapien

<400> 450
 acatgggttta atacaacaac aaaaaaattt aatcaagtga aacgtaataa actgaacaat 60
 aaacactcaa aacattttcc attggaaaca tgtaaagaca atatgagggtt ttgttaccat 120
 cttactgcaa ttttcttatg tgttactagt ctacataccc catgttttct gtaatcatgc 180
 agatgtgaat ggaagtttga atgattaaat aaatgaaaag tccgtttact gcagggaaatc 240
 atttcacaag gcagccaaac cgggttttaga gaacaaaact attcaagaaa ttctcc 296

<210> 451
 <211> 294
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (294)
 <223> n = A,T,C or G

<400> 451
 acatgntcca aggcacgcgn ctgtgaactt cctctgagtg aaggcatccc ctccagcacc 60
 tttcagcctg ctagttagga cgacccgcg ccaccctcca ggacctccag cctgcactg 120
 cctttcctct cttttaataa attcttcatt gatttcta atgtaaaaaa aaagtttact 180
 gtaaagtgtt caaataanga aatttttttt aaaagtcctc agtaattcta ccagtaacaa 240
 ttgttatggg cacatttgct tttggaagat ttcttttgta tgcattgggat aagt 294

<210> 452
 <211> 129
 <212> DNA
 <213> Homo sapien

<400> 452
 acttttagat cacaaatttg cctttaagta acacataata cacttaaggc agatttgcct 60
 tacaggtggc ctcagcttct aaacaccact acactgcttt atataaaaaa caaaatcac 120
 atagaagag 129

<210> 453
 <211> 151
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1) ... (151)
 <223> n = A,T,C or G

<400> 453
 actctcaann tgtatttagg tgccaacaca tttaggatca ttgngnnttc tcagtgaatt 60
 gaccttttta tgagaataaa atgtctatatt ctgaaatgtc cctatttctg gaaatgttcc 120
 ttatactaaa gtccaacttg tgtggattan t 151

<210> 454
 <211> 119
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(119)
 <223> n = A,T,C or G

<400> 454
 tgctgatgna gcatgctttt taaatccttt aaaaacactc accatataaa cttgcatttg 60
 agcttggtgtg ttcttttgtt aatgtgtaga gtctctcctt ctcgaaattg ccagtgtgt 119

<210> 455
 <211> 515
 <212> DNA
 <213> Homo sapien

<400> 455
 accttataaa gttccttttc atccttctct gtcttcaact gacattcaag ttgttctctt 60
 tcatgttgtg ccttcttgag tttggccttt aaactgtcta attcggtttc ttttcaatt 120
 gctttatgtg ttactgacac aatatcttcc tcaagctgat gggctttgga tgtagcatca 180
 ctgaacctct tcttaaacctc ttcattttcc atttttaagc tttgtgttac ttcagtaaga 240
 cccttttgtt ctgcttgacg ttggtcacat ctttctttct catggttlaag ttctctttcc 300
 attctcccaa cttgttctcg aagtgtgtgt gtcttctttt ccagaacggc aattaacttt 360
 aacagtctct ctttttcttt catggttttc tcaattttca actcaagaag gcctgctttt 420
 gtggtcacca ctaacatgtc agaatttctt tcatcttcca tagtaagcag ctcttcaact 480
 ggagaagaag ctcgaaactg gaaaggtgta cctgc 515

<210> 456
 <211> 350
 <212> DNA
 <213> Homo sapien

<220>
 <221> misc_feature
 <222> (1)...(350)
 <223> n = A,T,C or G

<400> 456
 actcccctcc ccaaataga acctcaaaga ctgatccatt tcccctaggg cctggggccag 60
 gagtagctca ctgctcactg ctgaggagaa aggcacaaga tataatgtca taagagcagg 120
 acagtggctc agcctacaga gttccctata ggggaaagaa ggcaggaaat aggcgcaggg 180
 tctggctctg tcctgcacc accctgagca gctagtcttg ggaagggatt acaggccctg 240
 ggccatagga tgctcgccat tctgctttcc tctcctgttt ctctccctgt gctgctccct 300
 tttagccagn gctgagaaat gttcancacc tgaggcaaaa ctgccatagt 350

<210> 457
 <211> 293
 <212> DNA
 <213> Homo sapien

<400> 457
 gcagggccaa cagtcacagc agccctgacc agagcattcc tggagctcaa gctcctctac 60

```

aaagaggtgg acagagaaga cagcagagac catgggaccc ccctcagccc ctccctgcag 120
attgcatgtc ccctggaagg aggtcctgct cacagcctca cttctaacct tctggaaccc 180
accaccact gccaaagctca ctattgaatc cagcgcattc aatgtcgcag aggggaagga 240
ggttcttcta ctcgcccaca acctgccccca gaatcgtatt ggttacagct ggt 293

```

```

<210> 458
<211> 500
<212> DNA
<213> Homo sapien

```

```

<400> 458
actagactcc agattaccct ttcttaataa atatctcagg gtaaggaaag aaagaaactg 60
tatagatata tttaaaatag agaatacttt ccaagcaata catgatgcct ttcctaaaag 120
actctaaaag aaaaagattc tgtaactctc ttttagcacc aaattattgt ttatcttgct 180
ggatatttta tatgaacagt gttaatttag atgcactaaa gcaaggtag gcaaaactaca 240
accatgagtc aaacatggcc acaccattc atttgctatt gtctaagctg gttttgctact 300
acaactgcag agttgaatag atgcagcaga tcctttacag aaaaagtttt ctgacctcaa 360
ttctaaagta attgtagtag ggagctggag gactttcttt ccctttatgg taattttttg 420
agctacaaaa agagccttgc agaaatgggt gaagggatta atctttttaa aataaatgct 480
atatattagg aaaataaaaa 500

```

```

<210> 459
<211> 394
<212> DNA
<213> Homo sapien

```

```

<400> 459
ggtgaaaaga cttgattttt tgaaaggatt gtttatcaaa cacaattcta atctcttctc 60
ttatgtattt ttgtgactta ggcgagttg tgtagcagtt gagtaatgct ggtagctgt 120
taagggtggcg tgttgagtg cagagtgctt ggctgtttcc tgttttctcc cgattgctcc 180
tgtgtaaaga tgccttgctg tgcagaaaca aatggctgtc cagtttatta aaatgcctga 240
caactgcact tccagtcacc cgggccttgc atataaataa cggagcatac agtgagcaca 300
tctagctgat gataaatata cctttttttc cctcttcccc ctaaaaatgg taaatctgat 360
catatctaca tgtatgaact taacatggaa aatg 394

```

```

<210> 460
<211> 279
<212> DNA
<213> Homo sapien

```

```

<220>
<221> misc_feature
<222> (1) ... (279)
<223> n = A,T,C or G

```

```

<400> 460
actnccgatt gaagccccc ttcgtataat aattacatca caagacgtct tgcactcatg 60
agctgtcccc acattaggct taaaaacaga tgcaattccc ggacgtctaa accaaaccac 120
tttcaccgct acacgaccgg ggggtatacta cgggtcaatgc tctgaaatct gtggagcaaa 180
ccacagtttc atgccatcg tcctagaatt aattccccta aaaatctttg aaatagggcc 240
cgtatttacc ctatagcacc ccctctagag caaaaaaaaa 279

```

```

<210> 461
<211> 278
<212> DNA

```

<213> Homo sapien

<400> 461

```

tttggacact agggaaaaaac cttgtagaga gagtaaaaaa tttaacaccc atagtaggcc      60
taaaagcagc caccaattaa gaaagcggtc aagctcaaca cccactacct aaaaaatccc      120
aaacatataa ctgaactcct cacaccaatc tggaccaatc tatcaccta tagaagaact      180
aatgtagta  taaagtaaca tgaaaacatt ctctccgca taagcctgcg tcagattaaa      240
acactggact gacaattaac agccaatatc tacaatca                               278

```

<210> 462

<211> 556

<212> DNA

<213> Homo sapiens

<400> 462

```

aacgtccaag ggggccacat cgatgatggg caggcgggag gtcttggtgg ttttgtattc      60
aatcactgtc ttgccccagg ctccggtgtg actcgtgcag ccatcgacag tgacgctgta      120
ggtgaagcgg ctggtgccct cggcgcggtat ctcgatctcg ttggagccct ggaggagcag      180
ggccttcttg aggttgccag tctgctggtc catgtaggcc acgctgttct tgcagtggta      240
ggtgatgttc tgggaggcct cggtagcatc caggcgcagg aaggtcagct ggatggccac      300
atcggcaggg tcggagccct ggccgccata ctggaactgg aatccatcgg tcatgctctc      360
gccgaacccg acatgcctct tgtccttggg gttcttgctg atgtaccagt tcttctgggc      420
cacactgggc tgagtggggt acacgcaggt ctaccagtc tccatgttgc agaagacttt      480
gatggcatcc aggttgacgc cttggttggg gtcaatccag tactctccac tcttccagtc      540
agagtgccac atcttg                               556

```

<210> 463

<211> 659

<212> DNA

<213> Homo sapiens

<400> 463

```

cacactgtgc ctttccagtt gctggcccg taaaaaggcc tgaacctcac cgaggatacc      60
tacaagcccc ggatttacac ctgcccacc tggagtgcct ttgtgacaga cagttcctgg      120
agtgcacgga agtcacaact ggtctatcag tccagacggg ggcccttggg caaatattct      180
tctgattact tccaagcccc ctctgactac agatactacc cctaccagtc cttccagact      240
ccacaacacc ccagcttctt cttccaggac aagagggtgt cctggctcct ggtctacctc      300
cccaccatcc agagctgctg gaactacggc ttctcctgct cctcggacga gctccctgtc      360
ctgggcctca ccaagtcttg cggctcagat cgcaccattg cctacgaaaa caaagccctg      420
atgctctgcg aagggtctct cgtgycagac gtcaccgatt tggagggctg gaaggctgcg      480
attcccagtg ccctggacac caacagctcg aagagcacct cctccttccc ctgcccggca      540
gggcacttca acggcttccg cacggtcatc cgcccttctt acctgaccaa ctccctcaggt      600
gtggactaga cggcgtggcc caagggtggt gagaaccgga gaacccagc agccctca      659

```

<210> 464

<211> 695

<212> DNA

<213> Homo sapiens

<400> 464

```

accttcattt gaccccatca gcttcagggc cttctttaca tttccactgg cctgatccat      60
gtatgcaatg ctatttttgc agtgatatgt gatgttctgg gaagctcggc tggagagaag      120
tcgaaggaat gccagctgca catcaaggac atcttcagga agttcaggat tgccgtagct      180
aaactgaaaa ccaccatcca tggactctcc aaaccaaagc tgtttcttct cagcactaga      240
atctgtccac cagtgtttcc gtggaacatt caaaggattg gcacttatgc atgtttcccc      300

```

```

agtttccata ttacagaata ccttgatagc atccaatttg catccttggt taggggtcaac 360
ccagtattct ccactcttga gttcaggatg gcagaatttc aggtctctgc agtttctagc 420
gggggttttta cgagaaccat caggactaat gaggtcttct atttgtccat taacagactt 480
gagtgaagtc ataatctcat cggtggtgat tttgaaatcc attggttcat ctccataata 540
cggggcaaaa ccgccagctt ttccacctcc aatcccagca atggcagcgg ctccaacacc 600
accacagcaa ggaccagggg caccaggagg tccaggaggg cctggttgcc ctgggtggcc 660
tggggagccc tcagatctc ttccacctct gttac 695

```

<210> 465

<211> 73

<212> DNA

<213> Homo sapiens

<400> 465

```

caggtccaga gctcccaggt ttccagggtg cagtcctctc agtcccagag ctcccagggt 60
ttcgggtttcc agt 73

```

<210> 466

<211> 507

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(507)

<223> n = A,T,C or G

<400> 466

```

agcactggca gaggnagcca aatatagtga tgtgcgccag agataagtat tctcctctcc 60
aagcatattg ctatacaaga ctttaaagac ttcataaaag ccaaacttgc agagtccctg 120
catggagtag ccaaggaaag tcggagccca tccttttagc aaaccacgaa caccatcttc 180
tttaagtgtg actgagaatc cgttaaatat gcccttgtag ttttgggggt ccacctgcat 240
acggcatttc actaaatcca ggggaaccac agcagtgtgt gtcagaccac aacttaagac 300
cccaccaaag ccacacagtg cataatactt cgcggagcca aattcacaac tgtactcttc 360
cacgycggcg gctgccaggt tgcgagggcg gcggggctgg cccgtgggccc ctggggagct 420
gctgcggagg tccccgagac catcgtgcac canctgcaga tgtggcgtgt tgaagggggt 480
cgcccgcgcc aggtgcgcca cggacga 507

```

<210> 467

<211> 183

<212> DNA

<213> Homo sapiens

<400> 467

```

cctcatgagc taccgggcca gctctgtact gaggtctacc gtctttgtag gggcctacac 60
cttctgagga gcaggagggg gccaccctcc ctgcagctac cctagctgag gagcctgttg 120
tgaggggcag aatgagaaaag gcaataaagg gagaaagaaa aaaaaaaaaa aaaagggcgg 180
ccg 183

```

<210> 468

<211> 129

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(129)

<223> n = A,T,C or G

<400> 468

```
gcggccgcgt cgaccggcgc cgtcgggcnc cgggcccgggc catggagctg tggacgtgtc 60
tggccgcggc gctgctgttg ntgntgctgn tggcgcagtt gagccgcncn gccgagttct 120
acnccaang                                     129
```

<210> 469

<211> 243

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(243)

<223> n = A,T,C or G

<400> 469

```
gcggccgcgt cgacnggccca tggagactgt ggcacagtag actgtagtgt gaggctcgcg 60
ggggcagtggt ccatggaggc cgtgctgaac gagctggtgt ctgtggagga cctgctgaag 120
tttgaagaaga aatttcagtc tgagaaggca gcaggctcgg tgtccaagag caccgagttt 180
gagtacgcct ggtgcctggt gcggagcaag tacaatgatg acatccgtaa aggcacgtgt 240
ctg                                     243
```

<210> 470

<211> 452

<212> DNA

<213> Homo sapiens

<400> 470

```
cctcaagtac gtccggcctg gtggtgggtt cgagcccaac ttcattgctct tcgagaagtg 60
cgaggtgaac ggtgcggggg cgcacctctt ctgcgccttc ctgcgggagg ccctgccagc 120
tcccagcgac gacgccaccg cgcttatgac cgaccccaag ctcatcacct ggtctccggt 180
gtgtcgcaac gatgttgctt ggaactttga gaagtccctg gtgggcccctg acggtgtgcc 240
cctacgcagc tacagccgcc gcttccagac cattgacatc gaggctgaca tcgaagccct 300
gctgtctcaa gggctcagct gtgcctaggg cgccctcctt accccggctg cttggcagtt 360
gcagtgtctg tgtctcgggg gggttttcat ctatgagggt gtttcctcta aacctacgag 420
ggaggaacac ctgatcttac agaaaatacc ac                                     452
```

<210> 471

<211> 168

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(168)

<223> n = A,T,C or G

<400> 471

```
cttctccgct ccttctanga tctccgcctg gttcggncgg cctgcctcca ctctgcctc 60
taccatgtcc atcagggtga cccagaagtc ctacaagggtg tccacctctg gccccggggc 120
cttcagcagc cgctcctaca cgagtggggc cggttccgcg atcagctc                                     168
```

<210> 472
<211> 479
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(479)
<223> n = A,T,C or G

<400> 472
gccaggcgtc cctctgtctg ccactcagt ggcaacaccc gggagctggt ttgtcctttg 60
tggagcctca ncagttccct ctttcanaac tcactgccaa gagccctgaa caggagccac 120
catgcagtgcc ttcagcttca ttaagaccat gatgatccct tccaatttgc tcacttttct 180
gngtggcgca gccctggttg cagcgggcat ctgggtgnca atcgatgggg catcctttct 240
gaagatcttc gggccactgt cgtccactgc catgcagttt gtcaacgngg gctacttcct 300
catcgcagcc ggcggttggt tntttgctct tggtttccct ggctgctatg gtgctaanac 360
tgagagcaag tgtgccctcg tgacgntctt cttcatcctc ctctctntct tcattgctga 420
ggntgcagnt gctgaggtcc gccttggtgt acaccacaat ggntgagccc ttntctgacn 479

<210> 473
<211> 69
<212> DNA
<213> Homo sapiens

<400> 473
gagcgatgga gcgtgggtag ggaggggtcca cagtgtccac tcgccgtgtg cgaagggtga 60
ctcggtagt 69

<210> 474
<211> 155
<212> DNA
<213> Homo sapiens

<400> 474
gccgccactg ccgggagagc tcgatgggct tctcctgcgc gccgcccggg gtctggccga 60
gtccagagag ccgcggcgcc tcgttccgag gagccatcgc cgaagcccga gcccggtcc 120
cgggttgggg actgcagggg aaggcagcgg tggcg 155

<210> 475
<211> 282
<212> DNA
<213> Homo sapiens

<400> 475
ggcttcgacg ttggccctgt ctgcttccct taaactccct ccatcccaac ctggctccct 60
cccacccaac caactttccc cccaaccggg aaacagacaa gcaacccaaa ctgaaccccc 120
tcaaaaagcca aaaaatggga gacaatttca catggacttt ggaaaatatt tttttccttt 180
gcattcatct ctcaaaactta gtttttatct ttgaccaacc gaacatgacc aaaaacccaa 240
agtgcattca accttaccaa aaaaaaaaaa aaagggcggc cg 282

<210> 476
<211> 434
<212> DNA

<213> Homo sapiens

<400> 476

```
ctccaggaca gcgtccagct tgggtgctgtt gaagacgaag tggagcggat ggtttagtaa 60
acgagtgatg gtgctgagcg gcgtgcagtc ttccgggatcc acgaaggcca agtccttgag 120
gtagagcatg tccacgatgt tggagcgctc ctccctcgta accgggatgc gcgtgtggcc 180
gctctgcatg atgctggcca ggacgccgaa gtccagcacg gtgctggcgt ccagcatgaa 240
gcagtcttcg aggggctga gcacgtctc cacggtccgg cagcgagca cgccttgct 300
gagatcgctg taggggtcgc cgccgccg cgccagctcc agcaccgct cccgcagccg 360
cccgggccgc gccgccagct ccagcagctg cccacgggc agcgcgacgg gcagagttag 420
caggacggcc aggc 434
```

<210> 477

<211> 314

<212> DNA

<213> Homo sapiens

<400> 477

```
ggcgggcgct agctggctcc gggcagctcg gccttggggg cttcggggcc ccgagacgcg 60
gggctatga gtggggcgtg cgctccacgc ggaagtccga gcctcctccc ctggataggg 120
tgtacgagat ccctggactg gagcccatca cctttgcggg gaagatgcac ttcgtgccct 180
ggctggcgcg gccgatctt ccgccttggg accgcggcta caaggacca aggttctacc 240
gctcgcctcc tcttcacgag catccgctgt acaaagacca ggctgctat atctttcacc 300
accgttgccg cctt 314
```

<210> 478

<211> 317

<212> DNA

<213> Homo sapiens

<400> 478

```
aacagagtga tcattccagt taagcggggc gaagagaata cagactatgt gaacgcaccc 60
tttattgatg gctaccggca gaaggactcc tatatcgcca gccaggggcc tcttctccac 120
acaattgagg acttctggcg aatgatctgg gagtggaaat cctgctctat cgtgatgcta 180
acagaactgg aggagagagg ccaggagaag tgtgccagat actggccatc tgatggactg 240
gtgtcctatg gagatattac agtggaaactg aagaaggagg aggaatgtga gagctacacc 300
gtccgagacc tcttggg 317
```

<210> 479

<211> 171

<212> DNA

<213> Homo sapiens

<400> 479

```
aggtgctttg ctagatgctg tgacaggtat gccaccaaca ctgctcacag cttttctgag 60
gacaccagtg aaagaagcca cagctcttct tggcgatatt atactcactg agtcttaact 120
tttcaccagg ggtgctcacc tctgccccta ttgggagagg tcataaaatg t 171
```

<210> 480

<211> 65

<212> DNA

<213> Homo sapiens

<400> 480

```
ccccagtg aaggctccca ccctggtaga tgaacagccc ctggagaact acctggatat 60
```

ggagt

65

<210> 481

<211> 207

<212> DNA

<213> Homo sapiens

<400> 481

```
cacagcgtgc tctgcggggt cactcccact ttgttagtga tgtggttatc tcctcagatg 60
gccagtttgc cctctcaggc tcttgggatg gaaccctgcg cctctgggat ctcacaacgg 120
gcaccaccac gaggcgattt gtggggccata ccaaggatgt gctgagtgtg gccttctect 180
ctgacaaccg gcagattgtc tctggat 207
```

<210> 482

<211> 319

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(319)

<223> n = A,T,C or G

<400> 482

```
cacactgtgc ccttcagtt gctggcccgg taaaaaggcc tgaacctcac cgaggatacc 60
tacaagcccc ggatttacac ctgcgccacc tggagtgcct ttgtgacaga cagttcctgg 120
agtgcacgga agtcacaact ggtctatcag tccagacggg ggccctttggt caaatattct 180
tctgattact tccaagcccc ctctgactac agatactacc cctaccagtg cttccaaact 240
gcacaacacc cnagcttnct cttccagnac aagagggtgt cctggtcctt ggccctacctc 300
cccaccatcc agagctgct 319
```

<210> 483

<211> 233

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (1)...(279)

<223> n = A,T,C or G

<400> 483

```
acaggccccag tggcgccctag ccttcagctg ctgggctctc ccgagcctgc cttagcccat 60
acaaccactt gatcacgcgg gcattgcgct ccaccaccga cagcccatag ggaacgcgct 120
cccggggcccg ctctcaaca gtcaccgagc tgcggcgggg gcagccccct tcagagctgc 180
ccggcccagc actgggcccct gccagggaca cnatatccga gctggcccgt gcc 233
```

<210> 484

<211> 194

<212> DNA

<213> Homo sapiens

<400> 484

```
agagcccttg ctgggggggtg cctgggagat ggggtaagaa gagctttcat ttgtctggta 60
gatagatagc atgtaagggg gtggttgctc caggaggcag ctgctgacag gtttgctaca 120
```


cacagccccg gactgtgttg cctgggtgct cattcagaga ggggctatca tctgggagcc 180
tgtgcccctg ggtc 194

<210> 485

<211> 67

<212> DNA

<213> Homo sapiens

<400> 485

tccatatcca ggtagttctc caggggctgt tcatctacca ggggaggagc ctcccactgg 60
gggaagt 67

<210> 486

<211> 70

<212> DNA

<213> Homo sapiens

<400> 486

taccgagtca accttcgcac acggcgagtg gacactgtgg accctcccta cccacgctcc 60
atcgctcagt 70